PULP & PAPER

APRIL 1959

The Riddle of Lignin
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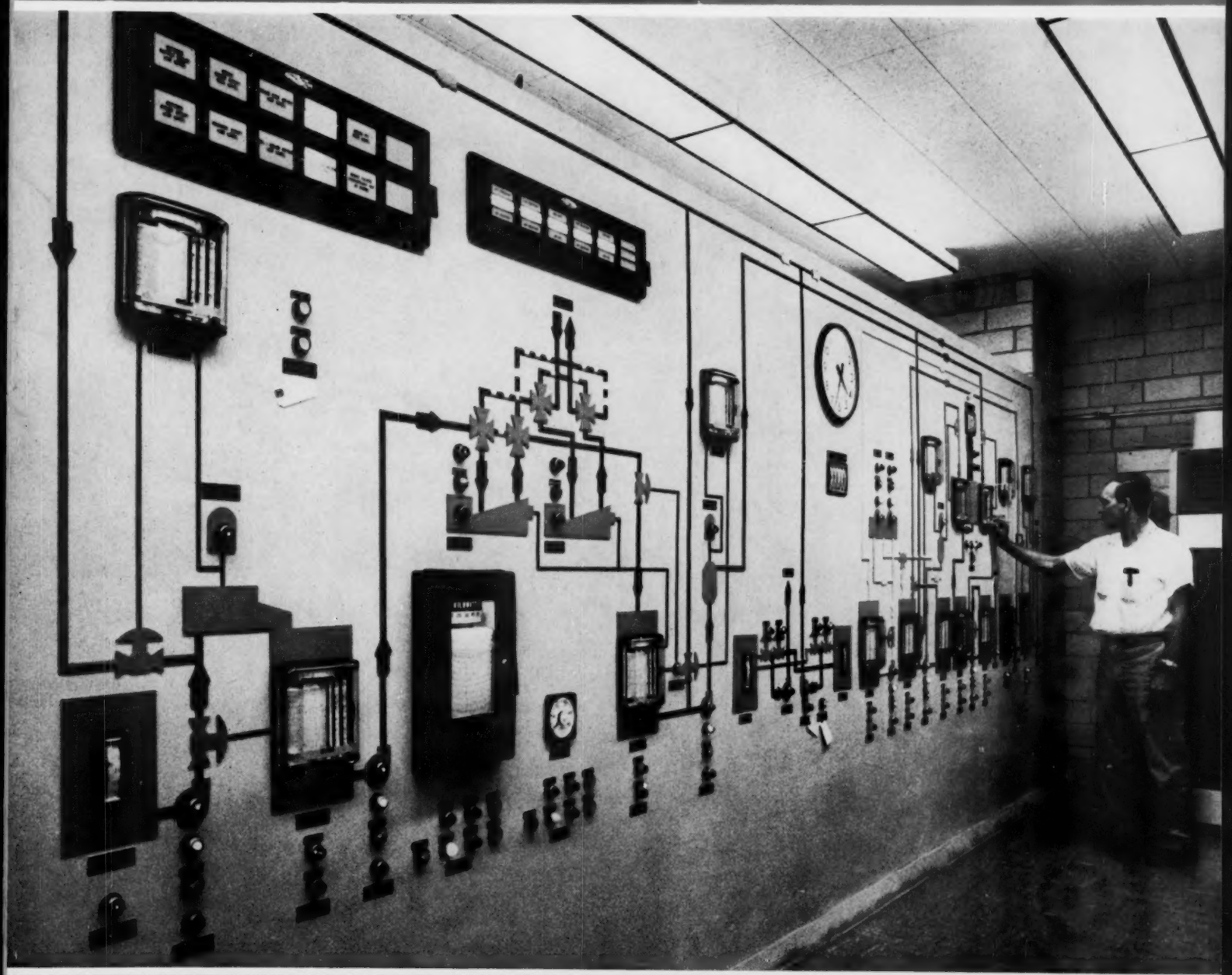
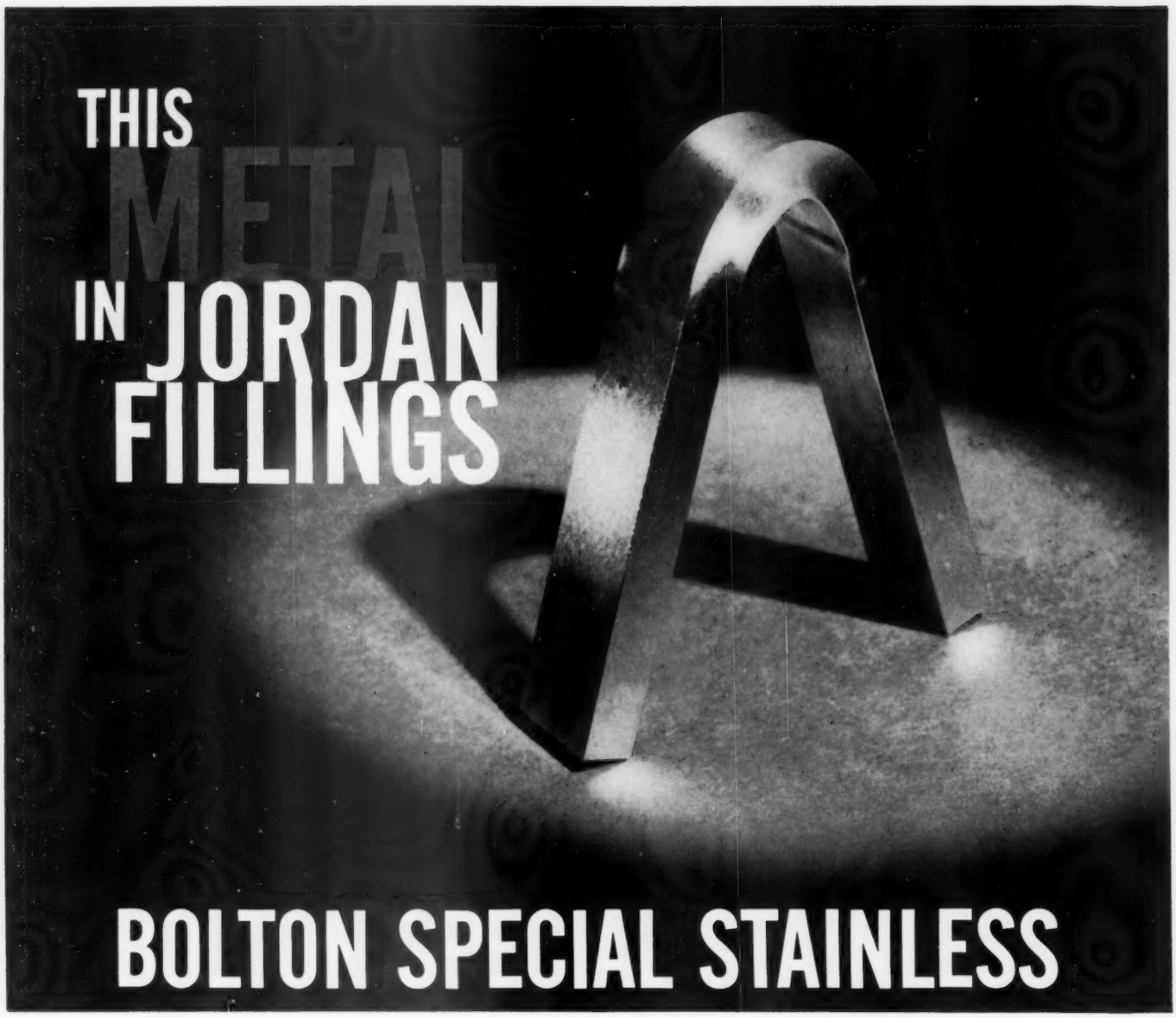
New Capacity Survey
page 63

Multi-Wire Fourdrinier
page 80



AUTOMATION—PAPER FOR NEW MARKETS

See page 72 for first story and pictures on Ecusta's new No. 10 machine



. . . means more to papermakers than any steel developed in two decades

Its unique properties provide: absolute resistance to corrosion from chemicals normally encountered in refining equipment — protection of the cutting edges against wear and abrasion — toughness to withstand deformation without fracture — and the capacity to resist severe shock.

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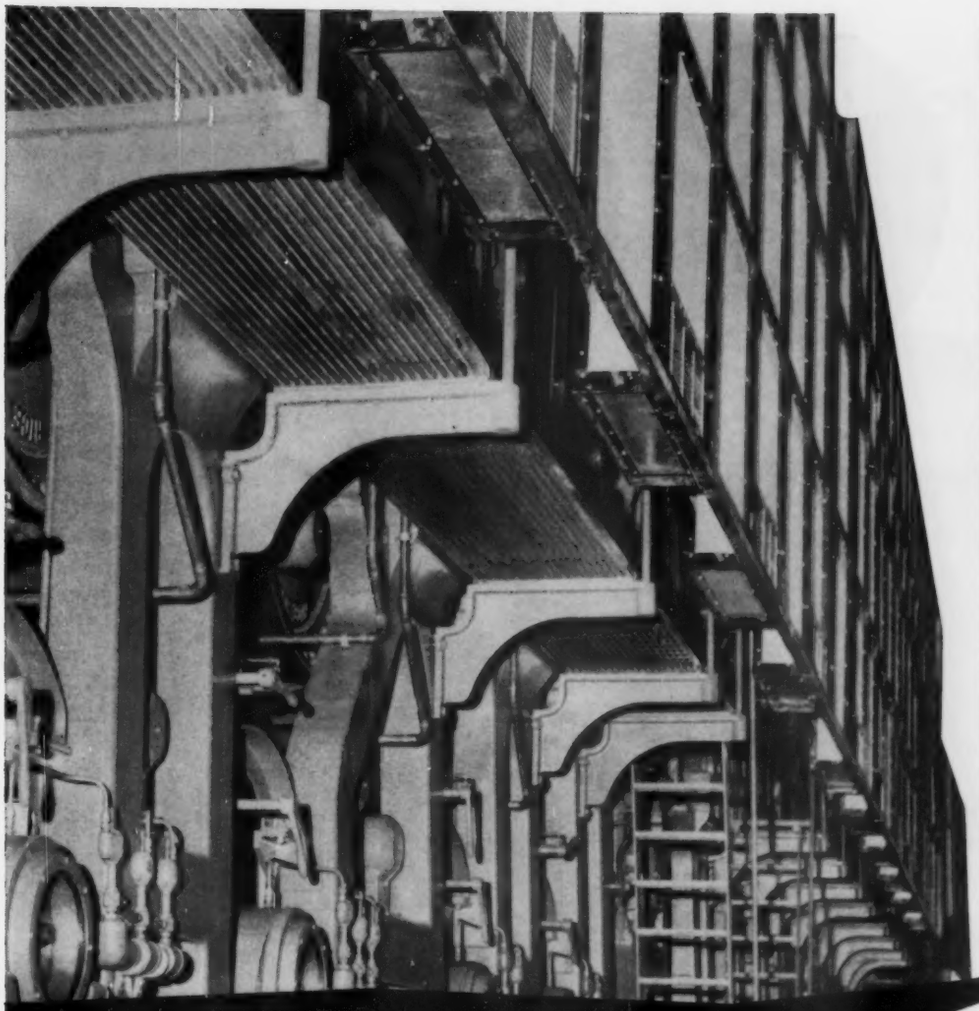
Bolton Special Stainless is a chrome-nickel alloy having a chrome and nickel content approximating that in 300 series Stainless. It has made possible a form of heat-treating never before used commercially on steel for refining equipment. Known as precipitation hardening, this in-plant custom heat-treating gives the finished steel the unique character of being entirely free of stresses. This Bolton heat treatment makes it practicable to control the relationship of mechanical properties of the metal to meet the specialized requirements of paper mill refining operations.

Brinell Hardness	Tensile Strength (Average Minimum)	% Elongation (2")	% Reduction of Area
321	180,200	16.4	74.2
363	199,300	14.5	41.9
415	211,700	14.0	32.1

Various heat treatments for differing mill applications

It has taken years to prove this metal under all operating conditions. Now we have standardized our inventories on Bolton Special Stainless. We are proud to offer this premium quality stainless at no additional cost. Bolton Special Stainless is on hand in quantity to make prompt shipments to the growing number of papermakers *who have compared* — in all patterns, in all makes of Jordans. Don't wait. Try it now. *Call or write John W. Bolton & Sons, Inc., Lawrence, Massachusetts.*

BOLTON EMERSON
TRADE MARK



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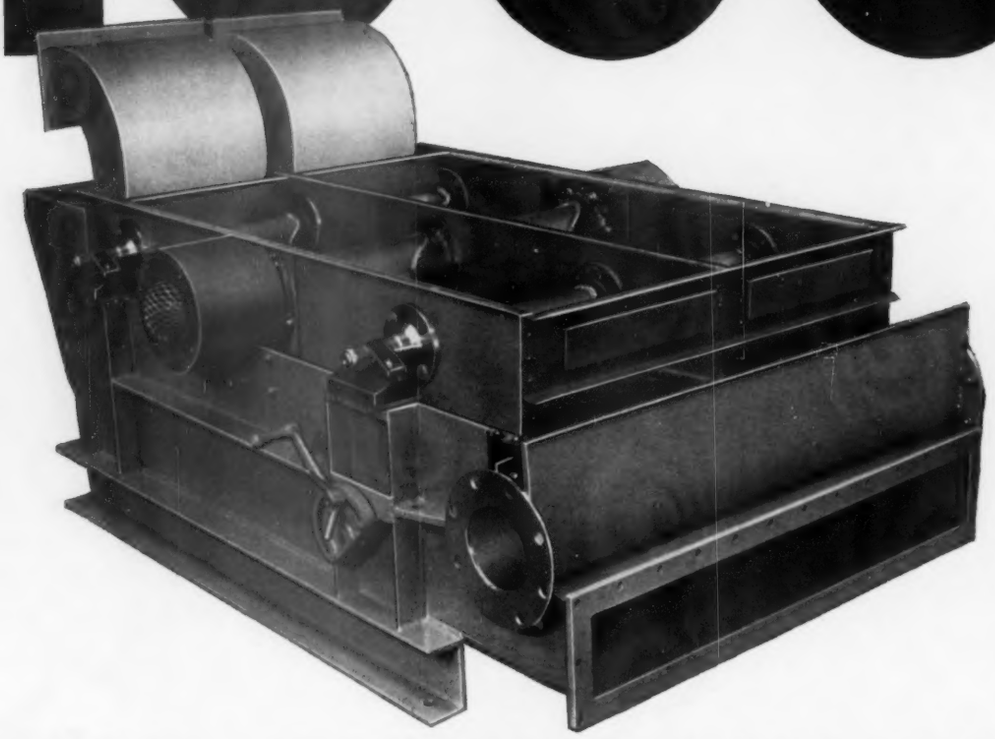

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PULP & PAPER

Reader's Guided Tour

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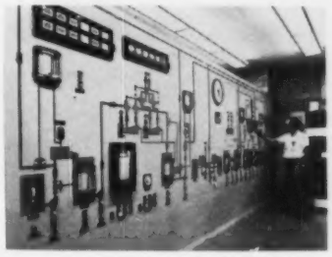
Credit where credit is due; Timing of Paper Week forum; Industry finds its voice

Future Lignin Depolymerizing Plants 61

. . . are envisaged by a veteran Crown Zellerbach research executive, Dr. J. S. Barton, who reviews a basic work on the great riddle of the structure of lignin—a major roadblock now to what may be fabulous industry growth

Cover Story—For a New Market 72

. . . that's the purpose of new No. 10 machine now running smoothly at Ecusta Division of Olin Mathieson. PULP & PAPER here presents an exclusive report. Because it is specially designed for large scale production of lightweight printing papers, it has more than usual interest



AUTOMATIC CONTROLS for Ecusta's new No. 10 machine are centered in this graphic panel.

Major Manufacturing "Break-Throughs" 79

. . . are coming soon, according to technical leaders at 1959 Paper Week including TAPPI Medal Winner Elderkin. At APPA annual meetings, there was subdued optimism. Ten-point programs to guide management in its relations with research men highlight a Research Forum. Technical sensation—a 5,000 fpm multi-wire Fourdrinier in Bristol, England

Growing Better Wood for Paper 117

. . . was subject of an outstanding study done in Australia. Permission of the Australian technical association was obtained for revealing this investigation which has contributed vastly to forest genetics progress

Use of Hardwood Fibers 124

. . . impact of recreation on privately owned forest lands, new developments in tree planting—these and other subjects were discussed at annual meeting of American Pulpwood Assn.

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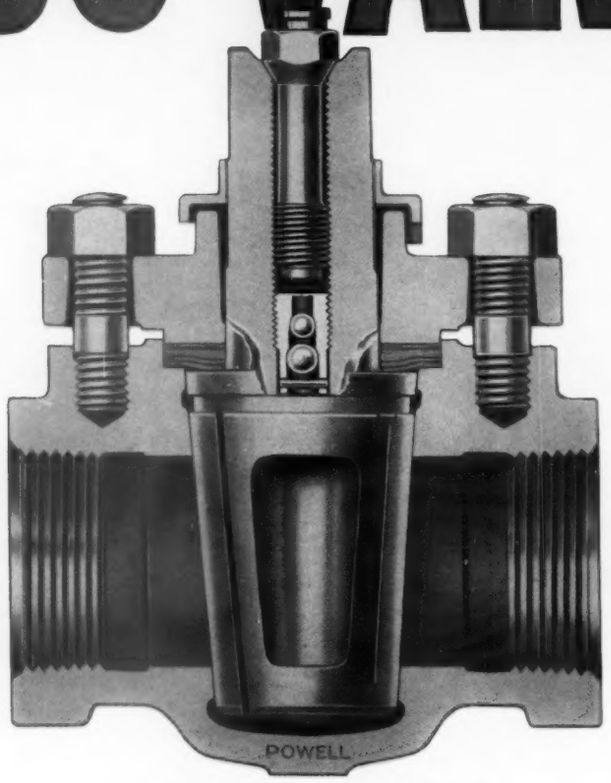

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MILLER FREEMAN PUBLICATIONS

A Question Regarding Stability of Cooking Liquors

Editor: My compliments to the Abitibi Power & Paper Co. and Dr. Dorland and his associates for a most excellent article on bisulfite pulping by the Arbiso process. (Pulp & Paper, Feb. 1959, page 66). Such a thorough disclosure of facts deserves a lot of thanks.

About 20 years ago we made a number of these cooks using magnesium base. The pulp yields and strengths were phenomenal. We also found that the strength was erratic at times. The cooks tended to "turn" readily. I'm wondering if Abitibi has experienced any decomposition of the liquor or if you have determined variations in thiosulfate content.

G. V. PALMROSE
Consultant for Acid Plant Designs
1270 S. W. Menlo Drive
Beaverton, Ore.

Reply from Abitibi

Editor: The question of the stability of sulfite cooking liquors has been reviewed by Stockman—*Svensk Papperstidning*, 54: 621 (1951), and the difficulty in re-cycling spent liquor for the purpose of increasing the solid content was attributed to the presence of formic acid, which leads to the formation of thiosulfate, which in turn may deposit sulfur. This series of reactions appears to be self catalyzed and would therefore be more serious in the presence of large quantities of bisulfites.

However, we performed a series of laboratory cooks with sodium bisulfite in which 50% of the cooking liquor was spent liquor recovered from the previous cook (spruce at 65% yield). The solids content quickly built up to 16.5%, but after 15 successive cooks there was no evidence of burning or any change in pulp quality. The chemical usage was held at 16% $NaHSO_3$ based on wood; cooking temperature, 155°. Evidently no build-up of thiosulfate occurred. Analyses show very low levels of thiosulfate in bisulfite spent liquors, as noted by Samuelson for regular sulfite—*Svensk Papperstidning*, 60: 388 (1957).

J. W. McKINNEY,
Associate Director of Research
Abitibi Power & Paper Co.
Sault St. Marie, Ont., Canada

Outside Storage of Chips Is Live Issue in East Canada

—Montreal, Canada

Editor: We were very interested in the excellent article that was entitled "Outside Chip Storage," by your Western Editor, Louis H. Blackerby.

The subject of chip storage in the open is becoming a live issue in Eastern Canada.

E. MacEWAN
Reed, Shaw & McNaught,
Insurance

MEETING DATES CALENDAR

May 1-2
Penn-Jer-Del Div., APPMSA, Spring Meeting
Robert Treat Hotel, Newark, N. J.

May 5
Golden Gate Dist., TAPPI
Claremont Hotel, Berkeley, Cal.

May 7-8
Cellulose Conference
State Univ. of New York, College of Forestry, Syracuse, N.Y.

May 7-8
Executives' Conference
Institute of Paper Chemistry, Appleton, Wis.

May 14
Michigan Div., APPMSA
Hotel Harris, Kalamazoo, Mich.

May 21-23
Pacific Coast Div., APPMSA, and Pacific Coast Section, TAPPI, Multiple Water Use Seminar
Gearhart Hotel, Gearhart, Ore.

May 22
Connecticut Valley Div., APPMSA
Strathmore Park, Woronoco, Mass.

May 25-27
American Society for Quality Control, Annual Convention and All-Industry Production & Quality Control Exposition
Public Hall, Cleveland, O.

May 25-27
TAPPI Coating Conference
Hotel Statler, Boston, Mass.

June 2-4
APPMSA National Meeting
Shamrock-Hilton Hotel, Houston, Texas

June 12
Miami Valley Div., APPMSA
Piqua Country Club, Piqua, O.

June 28-July 3
Forest Products Research Society, 13th National Meeting—"Research for Profit"
St. Francis Hotel, San Francisco, Cal.

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MONTHLY REPORT – WORLD NEWS

BLEACHED SULFITE PULP FROM SWEDISH PINE. . . . was recently placed on the market. Based on a process pioneered by Stora Kopparberg, the pulp is known as Stora 59 and is said to be suitable for a wide range of papermaking uses.

FRENCH PRODUCTION UP. . . . During the first nine months of 1958 paper and board output totaled some 1,600,000 metric tons in France, up 3.4% from the corresponding 1957 period. Pulp production at 653,000 tons was up 6.8%.

PREDICTIONS OF REVOLUTIONARY CHANGES . . . in manufacturing techniques; subdued optimism over future business prospects, and an analysis of Europe's Common Market highlighted 1959 "Paper Week," which drew more than 3500 pulp and paper men to New York City, U.S.A., in late February. (See story in this issue.)

INTERNATIONAL STANDARDIZATION OF PAPER AND PAPER PRODUCTS . . . is the aim of a worldwide project now underway. According to American Standards Assn., U. S. groups have expressed interest, and a committee is being formed to study possibility of American cooperation with the International Organization for Standardization.

IN SWEDEN: CAUTIOUS OPTIMISM. . . . Production of market chemical pulp in 1958 was down about 4% from 1957, says Lars Sjunnesson, managing director of the Swedish Cellulose & Mechanical Pulp Wood Assn. The quantity shipped, however, was only about 2% below the previous year. The trend has been far from uniform, with bleached pulps showing striking gains, unbleached falling off sharply. The industry sees a reversal of the trend in 1959.

BRITISH COATING PLANTS FOR U.S.S.R. . . . Bone Bros. Ltd., Wembley, England, is furnishing two complete plants to Russia for the coating of paper with polyethylene. Cost is $257,000 (£88,000).

U.S.A. PAPER PRODUCTION UP SLIGHTLY. . . . Preliminary Department of Commerce figures show paper and board production in 1958 totaled 30,797,000 short tons, up about 119,000 from 1957. Although paper was down 68,000 tons, paperboard showed a 91,000-ton gain, wet machine board was up 8,000 and construction paper and board up 88,000.

TETRA PAK INTRODUCED IN AUSTRALIA . . . for milk distribution. The Swedish invention for continuous packing of liquids will be produced by Moulded Products Ltd., Victoria, under license from Swedish Tetra Pak Co.

SALES-PRODUCTION COOPERATION NEEDED . . . for expected increase in paper and paperboard uses, according to R. A. Nash, sales and marketing vice pres., Sorg Paper Co., Middletown, Ohio, U.S.A. Higher production and better products will require careful study and planning by both sales and production personnel.

INDUSTRIAL GROWTH IN EASTERN SIBERIA . . . includes establishment of a paper and cellulose industry. Underway at Komsomolsk-on-the-Amur is construction of the Soviet Union's largest paper and cellulose plant. Production will include paper, board, paper and rayon pulp, as well as fiberboard and byproducts of cellulose. Similar plant is proposed for Nikolayevsk-on-the-Amur. In view of the area's small population, it is believed that production will be primarily for export—probably to southeast Asia.

FOLDING PAPER BOXES OFF. . . . According to Folding Paper Box Assn. of America, January U.S.A. shipments were off 3.6% in dollar volume and 5.3% in tonnage from the same month in 1958. January's dollar value of new orders, however, topped the figure of a year ago by 4.3% on increased tonnage of 1.9%.

NEW PAPER MILL FOR WEST SWEDEN . . . where Wargons AB is planning to build a plant at Vargon in order to process its entire pulp output. Estimated cost: $6,000,000 (Kr. 30,000,000).

B.F.Goodrich

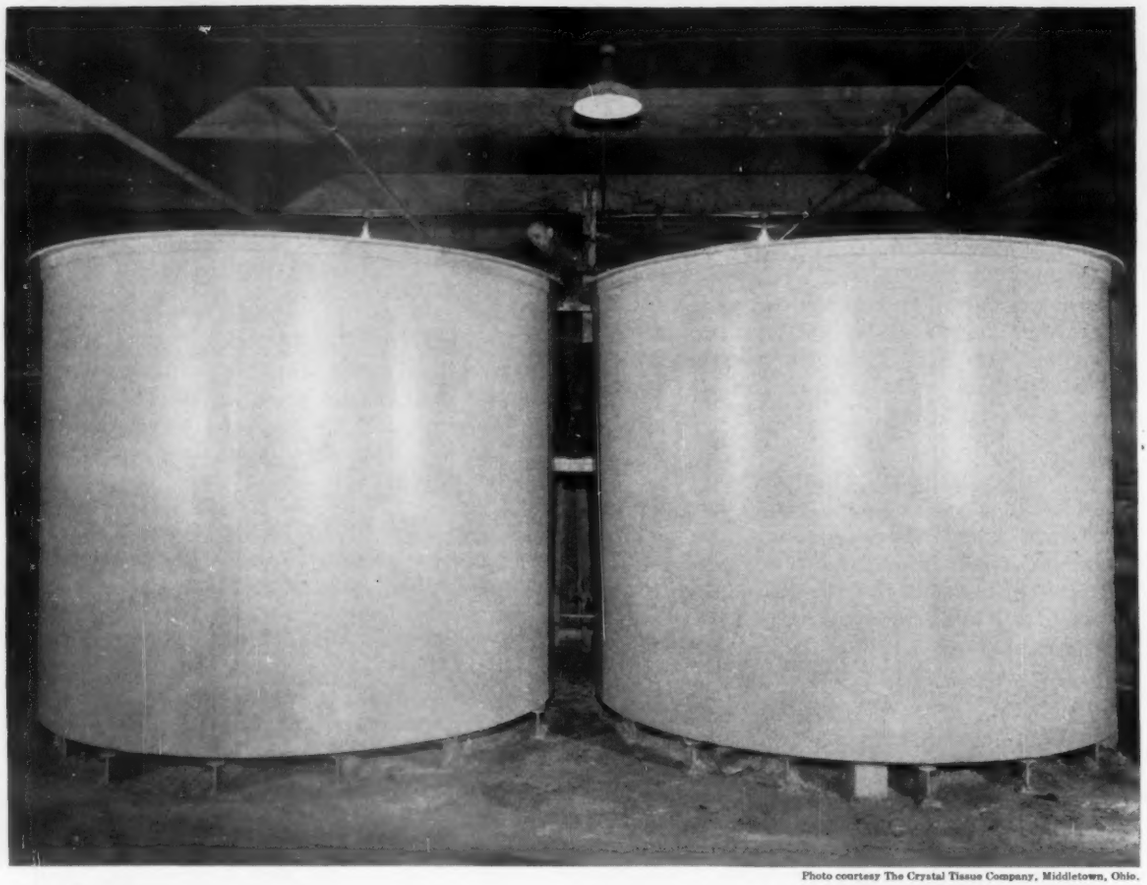


Photo courtesy The Crystal Tissue Company, Middletown, Ohio.

No holes, no leaks, no repairs—liquid alum stored safely in rubber

B. F. Goodrich improvements in rubber brought extra savings

Problem: This paper manufacturer wanted to cut costs by switching from powdered to liquid alum in their pulp mixture. But getting a tank to hold this corrosive solution was a problem. Wood tanks shrink, often leak. Lead-lined tanks require frequent repairs.

What was done: B. F. Goodrich engineers recommended Triflex rubber-lining for the two 5,000-gallon steel storage tanks. This lining is not one layer of rubber, but three—hard rubber for maximum corrosion resistance sandwiched between soft rubber for added protection.

Savings: Installed over 17 years ago, the B. F. Goodrich rubber-lined tanks pictured here are still in excellent condition, have needed no repairs on either the lining or the metal. The paper manufacturer feels that with proper care these tanks will last years more. Other tanks and pipe in the system are also B.F.Goodrich rubber-lined.

Why specify B. F. Goodrich: In the past 18 years, we have lined hundreds of tanks for alum service, as well as more than 75 railroad tank cars, several tank trucks, and thousands of pieces of pipe and fittings. While the initial cost of B.F.Goodrich rubber-lining is somewhat higher than wood or lead-lined tanks, the rubber-lined tanks do not leak, require little or no maintenance, and are, therefore, much more economical in the long run.

For more information, write *B.F.Goodrich Industrial Products Co., Tuscaloosa, Alabama, or Dept. M-560, Akron 18, O.*

B.F.Goodrich *industrial products*

MONTHLY REPORT – WORLD NEWS

RESURGENCE IN U.S.A. PULP INDUSTRY . . . predicted by Arne Hallencreutz, president of American SF Products Inc. Mr. Hallencreutz declares that capital goods orders placed by pulp firms is expected to increase. (American SF is a subsidiary of AB Svenska Flaktfabriken, Swedish manufacturer and engineer.)

KRAFT LINER PLANT FOR TENNESSEE, U.S.A. . . . where Tennessee River Pulp & Paper Co. will construct a $50,000,000 mill at Counce. According to G. W. E. Nicholson, president, capacity will be 500 tons daily. Completion set for early next year.

PLYWOOD PLANT CHIPS TO MEXICAN MILL. . . . A new Mexican plywood plant—Compania de Forestal de Oaxaca—is chipping veneer clippings and peeler cores and transporting them 500 miles by rail to a Mexico City pulp plant.

INCREASES IN PAPER AND PULP CAPACITIES FOR U.S.A. AND NORTH AMERICA . . . have been forecast in a survey published by American Paper & Pulp Assn., National Paperboard Assn. and U.S. Pulp Producers. In 1959-61 U.S. paper and board capacity is expected to increase 2,600,000 short tons. In 1959-60 North American woodpulp capacity will rise only 729,000 tons.

NEWSPRINT MILL FOR INDIA? . . . Efforts being made to get cooperation of a West German machinery builder in the construction of a plant for the production of newsprint from bagasse pulp. Capacity would be 30,000 tons yearly.

WEST GERMAN COMPETITION SHARP . . . in sales of corrugated board. While 1958 consumption was up, the increase failed to keep pace with capacity expansion. The Assn. of West German Corrugated Board Producers looks for a decline in profit margin.

USE OF DEADWOOD IN NEW ZEALAND. . . . Production of pulp, paper and cardboard from dead radiata pine logs is reported by three major mills—at Kawerau, Kinleith and Whakatane. Foresters say that per acre pulp yield is increased by as much as 20%.

EFFECTIVENESS OF NEWSPAPER ADS . . . is being studied in the U.S.A. under sponsorship of leading Canadian newsprint manufacturers. To be conducted by several universities with the advice of the American Newspaper Publishers Assn., the project is underwritten by Abitibi Power & Paper, Anglo-Canadian Pulp & Paper Mills, Anglo-Newfoundland Development, Canada Paper, Donnacona Paper, Powell River, St. Lawrence.

WESTERN CANADA'S NEXT BIG PULP MILL . . . is to be built at Castlegar, B. C. Celgar Ltd. has reaffirmed its decision to build the $50,000,000 project that will be B.C.'s first interior pulp producer. Target date for entry of Celgar sulfate pulp into the world market is March 1961. Daily capacity: 500 tons.

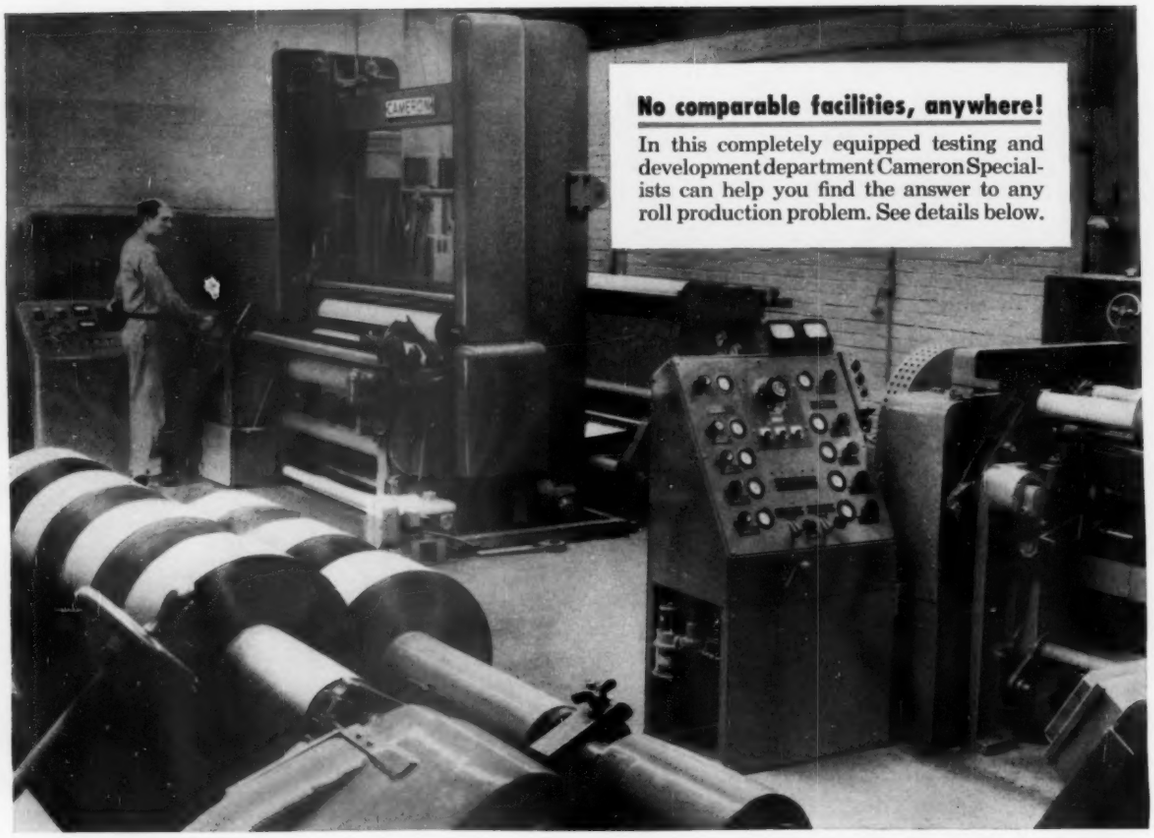
NORWEGIAN EXPORTS DOWN. . . . In the first nine months of 1958 paper and board exports were 276,000 tons, compared to 397,000 in the same period of 1957.

BRITISH COLUMBIA INTERESTS IN INDIA . . . British Columbia Forest Products Ltd., operating a pulp mill, sawmills and processing plants in western Canada, has purchased the holdings of Kapoor Sawmills Ltd. in the Koksilah District of India. Cost (including timberlands, camp sites, equipment) estimated at $3.000,000.

A NEW BOND MACHINE FOR FRASER PAPER LTD. . . . at its Madawaska, Maine mill, according to a report to PULP & PAPER, will be more than 200 in. wide. Details will be announced soon.

CANADA'S FIRST TRAILING BLADE COATER . . . will be installed by Provincial Paper Ltd. The Beloit unit will be used intially for experimental purposes.

STRENGTHENING NEWFOUNDLAND NEWSPRINT . . . is aim of Bowaters Newfoundland Pulp & Paper Mills Ltd. in an experiment that will combine Southern U.S.A. sulfate pulp with groundwood. Research is underway at Corner Brook, Nflnd., Canada, where 1,000 tons of Tennessee sulfate pulp have been imported.



No comparable facilities, anywhere!

In this completely equipped testing and development department Cameron Specialists can help you find the answer to any roll production problem. See details below.

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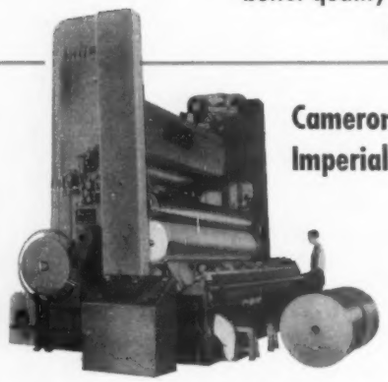

Cameron Imperial

High Speed Mill Type Winder – leader of the famous Cameron line of winders, slitter-rewinders, unwinds and web control systems for paper and board mills, finishing rooms and converting plants.

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MONTHLY REPORT – WORLD NEWS

MAJOR EXPANSION AT NAHEOLA . . . where Marathon, a division of American Can Co., will add a third paper machine at its recently completed pulp and paper mill. The unit will produce a wide range of paperboard for packaging.

GROWING INTEREST IN WEST COAST EXPANSION . . . is indicated by on-the-ground investigations on by several firms. Primary interest centers in Oregon and California. Of the companies "looking around," some already have West Coast operations, at least two have confined previous pulp operations to the East Coast, while one foreign firm is reportedly displaying a "quietly active interest."

SALE OF ITS OSWEGO, N. Y., PAPERBOARD MILL . . . is announced by American Can Co. Effective Feb. 1, 1961, operation of the facility will be assumed by Hammermill Paper Co. Reason for the long-term agreement is to assure continuity of paperboard supply from Oswego during the installation of a new paper machine at the American Can plant at Naheola, Ala. The sale does not affect other Oswego operations, which manufacture food packaging materials for the Marathon div.

PAPER COATING AT CROSSETT . . . installation has been completed of a paper coating pilot plant in The Crossett Co's Research Div., Crossett, Ark., to provide for study of various methods of applying coating, such as clay and plastics, to bleached foodboard and kraft paper. K. G. Chesley, Director of Research, said the experimental plant will make possible improved range and quality of Crossett products and services. The plant, designed by Dilts Div. of Black-Clawson, has capacity to run paper or board 12 to 36 in. wide, up to 500 fpm.

RESTIGOUCHE PULP MILL RUNS, DESPITE REPORTS . . . Contrary to published reports, the Restigouche Co. Ltd. bleached paper sulfite and dissolving pulp mill at Atholville, New Brunswick, Canada, an affiliate of the Fraser Cos. Ltd., is continuing to operate and there is no intention of shutting it down for any period. Executives of the company so advised PULP & PAPER recently, because of rumors which had been given circulation in the industry.

ST. REGIS, MONSANTO IN JOINT VENTURE . . . for production of a new type laminated plastic. Fome-Cor Corp. is producing on a limited scale at the Mount Wolf, Pa., plant of Superior Paper Products Co., a St. Regis subsidiary. A larger production unit is under construction at Monsanto's plant in Addyston, Ohio. Fome-Cor is a styrene foam plastic sandwiched between layers of kraft paper used for shipping perishables, cushioning, etc.

NEW MILL IN OPERATION . . . at Wallula, Wash., where Cascade Kraft Corp. is producing daily 150 tons of linerboard and multiwall bag paper. Plant, a subsidiary of Boise Cascade Corp., receives residue chips from sawmills by rail and truck. Adjacent corrugated container plant of Cascade Container Corp. (an affiliate) went into production a year ago.

IP SEES RISE IN QUARTER EARNINGS . . . Third quarter net profit and sales for International Paper Co. increased over the preceding quarter, although both sales and earnings for the first nine months of 1958 were lower than in '57.

LILY-TULIP SALES HIT RECORD PEAK . . . W. J. Bergman, chairman and president, reports sales of both the third quarter and the first three quarters of 1958 represent record sales for Lily-Tulip Cup Corp. (paper cups).

COMPLETE EXPANSION OF NO. 2 PAPER MILL . . . Downingtown Paper Co., Downingtown, Pa., recently completed a program comprised of new stock preparation, handling and storage facilities, a complete new eight cylinder wet end section for the No. 2 board machine, new reel, winder and slitter sections, two new calender stacks and a new cutter.

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WORLD PULP & PAPER Technical News

Fiber Fractions—Bleaching

KELLER, RUDOLPH, DUBACH, MAX, and RUTISHAUSER, MAX. Svensk Papperstidn. 61, no. 18B: 754-9 (Commemorative issue, Oct. 10, 1958). [In German; Swedish and English summaries] Abstr. Bull. I.P.C. 29. 804-5.

Regular unbleached spruce sulfite pulps of different degrees of delignification were fractionated, and the lignin content was determined both in the original pulps and in the fractionated fines (zero-fibers). The lignin content of the fines was 2.5 and five times as high as in the original pulps for hard- and soft-cooked pulps, respectively. The removal of zero-fibers considerably facilitated the bleaching of pulp. When fines amounting to 3.5-4.7% of the pulp were removed by fractionation, the chlorine consumption during two-stage bleaching was reduced by 20%, the duration of the second stage was shortened by 20-50%, and yield losses on bleaching were decreased by 1.0-2.3%. The quality of bleached pulps from which the zero-fraction had been removed was improved, showing a much lower resin content, higher alpha-cellulose content, increased folding endurance and tearing strength, and a lower tendency to discoloration (color reversion).

Capacitator Paper—Russia

DOLGALEVA, A. A. Bumazh. Prom. 33, no. 5: 10-13 (May, 1958). [In Russian] Abstr. Bull. I.P.C. 29: 885.

The effects of total and carbonate hardness of process water and of individual ions on pulp freeness, sheet formation, and paper properties were investigated on a laboratory and plant scale. Conventional and deashed kraft pulps beaten in a Jokro mill or in a hollander were used. Mono- and divalent cations (sodium, ammonium, calcium, and magnesium) in concentrations of 5-6 meq./liter and trivalent cations (aluminum) in concentrations of 1 meq./liter considerably decreased the rate of beating. Mono- and divalent cations in concentrations not exceeding 1 meq./liter, and anions (chloride and sulfate at 100 mg./liter and bicarbonate at 370 mg./liter) had no effect on the beating process. The adverse effect of cations was more pronounced at higher degrees of beating (94-97° S.-R.). Variations of pH within the range of 4-8.5 had no effect on pulp beaten to 95-97° S.-R. Monovalent ions, particularly sodium, increased the mechanical strength of paper slightly, but considerably decreased its electrical properties. Divalent and trivalent cations lowered both the mechanical and the electrical properties of paper. Samples of condenser paper were prepared on a plant-size paper machine, using water purified by filtering through silica, a hydrogen exchanger, degassing, and either passing through a sodium exchanger or alkalization with river water to a pH of 6.8-7.1. Water purified by the first method had a hardness of 0.02 meq./liter and by the second method, of 1-1.2 meq./liter. Paper obtained by using filtered water was of inferior quality, had a 20% lower electric strength, and showed higher dielectric losses. From the results obtained it appears that the problem of purification of water to make it suitable for use in the manufacture of condenser paper consists of completely removing sodium, iron, and aluminum and reducing the concentration of magnesium and calcium ions. The conventional methods of water softening with sodium hydroxide or carbonate and aluminum sulfate are, therefore, unsuitable. Water purification should involve the use of ion exchangers. Five procedures adapted to water of different quality and composition are recommended.

Presented with permission of The Institute of Paper Chemistry, under supervision of Curtis L. Brown, editor of IPC Bulletin. Photostats or translations of original reports available at reasonable cost by writing Eugene Bunker, librarian, Institute of Paper Chemistry, PO Box 498, Appleton, Wis., U.S.A.

Slovak Beech Prehydrolysis

GAJDOS, J. Papír a celulosa 13, no. 5: 97-100 (May, 1958). [In Slovakian; Russian, German, and English summaries] Abstr. Bull. I.P.C. 29. 871.

Beechwood chips were prehyrolyzed for up to 5 hr. at 150-170°C. and then digested at 160° with white liquor of 27% sulfidity. The solids: liquid ratio during prehydrolysis and digestion was 1:3.5. Determinations were made of wood weight losses in prehydrolyzed chips and of the alpha-cellulose content, hardness (Küng's number), solubility in 10 and 18% sodium hydroxide, and viscosity of kraft pulps. With increasing degree of prehydrolysis (as measured by wood weight loss) the hardness and viscosity of pulp decreased. Within the viscosity range for dissolving pulps, the relation between viscosity of unbleached pulp and degree of prehydrolysis was linear. The solubility of pulps in 10 and 18% sodium hydroxide decreased to a minimum with increasing degree of prehydrolysis until a weight loss of 23-24% was reached. At greater weight losses the solubility increased again. The difference between the solubilities in 10 and 18% alkali reached its minimum at 18-19% weight loss, then increased. It was established that the determination of weight loss during prehydrolysis is a reliable criterion for the evaluation of pulp properties. Under mild prehydrolysis conditions (loss up to 12%), easily hydrolyzed hemicelluloses are solubilized and the pulps contain up to 92.5% alpha-cellulose. Under more drastic conditions (18-19% loss), the alpha-cellulose content increases to over 94%. Higher weight losses result in higher beta-cellulose contents and lowered bleachability of pulps. For the manufacture of inferior-quality viscose, prehydrolysis of chips at 150° for 150 min., or at 160° for 30 min. can be recommended. If high-quality viscose is desired, the weight loss of wood should be 18-19%, i.e., the chips must be prehydrolyzed for 4 hr. at 150° or for 15 min. at 170°.

Activated Silicate Use—Russia

BLEIZIZE, T. P., and ERASHEVA, N. A. Bumazh. Prom. 33, no. 6: 17-19 (June, 1958). [In Russian] Abstr. Bull. I.P.C. 29: 812.

Laboratory experiments and plant trials were conducted to determine the effect of activated silicate (*I*) on the retention of kaolin and the value of *I* as a substitute for animal glue. The *I* was obtained from a 2% water solution to which sufficient 5% sulfuric acid was added to lower its alkalinity to 0.8-0.9 ml. of 0.1 *N* alkali/cc. The resulting *I* solution was stable for 22-24 hr. Under laboratory conditions, the addition of 2.5-2.7% of alum and 0.35% of *I* to a fiber suspension gave an 85% retention of kaolin. Similar results (82-83% retention) were obtained under plant conditions by adding to the pulp (a blend of 35% unbleached sulfite and 65% mechanical pulps) 28-30 kg./ton of alum in the beater and up to 4.5 kg./ton of *I* (calculated as silica) on the paper-machine wire. To keep the ash content of paper at the normal level of 12%, the amount of kaolin added was correspondingly lowered.

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The Seminole Chief is washed daily with the hose that needs no care

24 hours a day . . . 7 days a week . . . this U.S. Rubber Hose is used to wash down the "Seminole Chief"—the giant new paper machine in the St. Regis Paper Plant in Jacksonville, Florida. The Fourdrinier wires, for example, must never be permitted to clog up with fibre. Clogging would mean shutting down the machine for an hour or more. Constant hosing prevents this. The hose itself is roughly handled—it lies on the floor all the time, receives no care whatever. Thanks to its abrasion-resistance, flexibility and durability, U.S. Paper Machine Hose *takes care of itself.*

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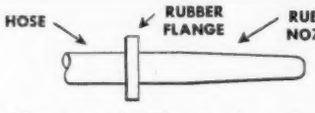

New integral rubber nozzle on Paper Machine Hose has a built-on flange approximately 4" from the end. Flange is ½" wide, ⅝" high; it prevents the nozzle from lying flat where it can be damaged. Workmen like the easy grip the flange gives.

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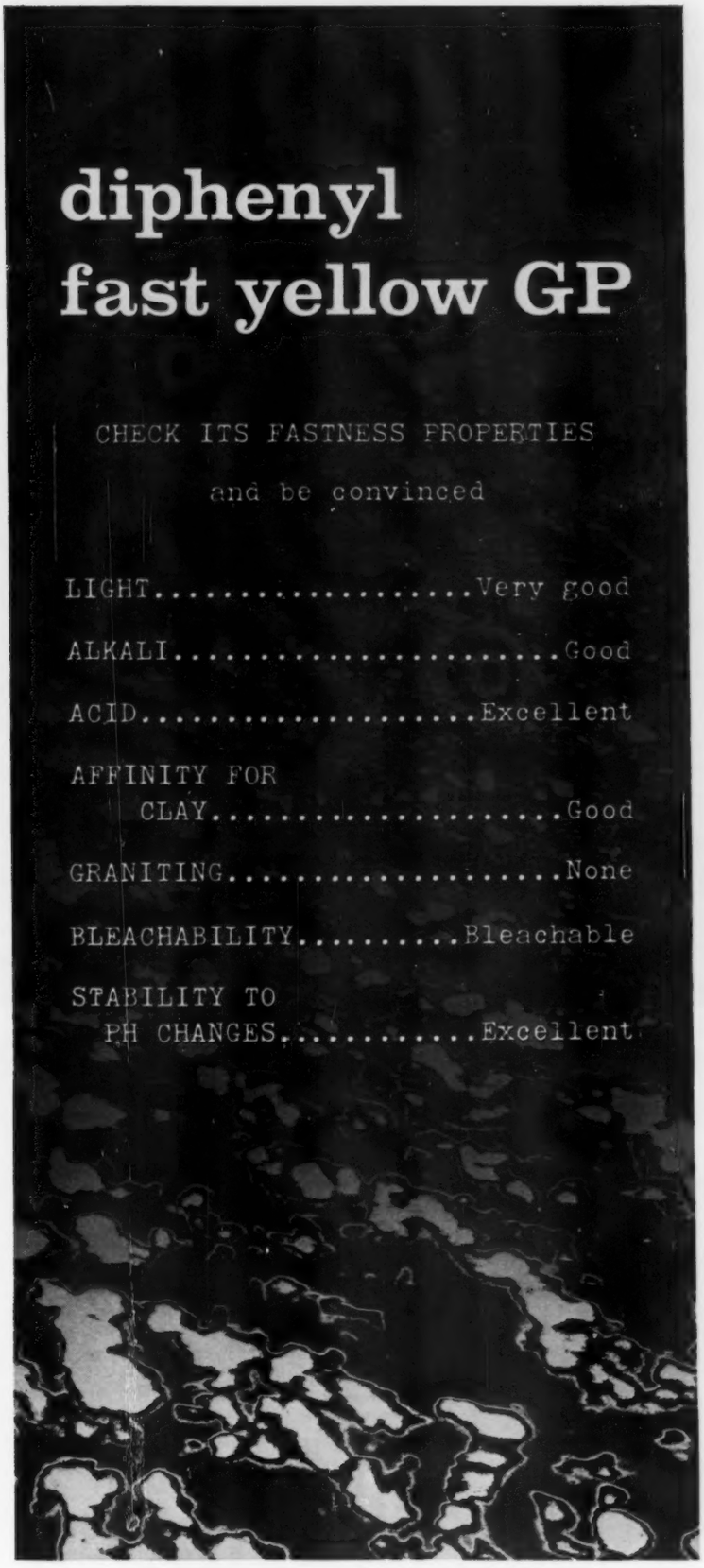

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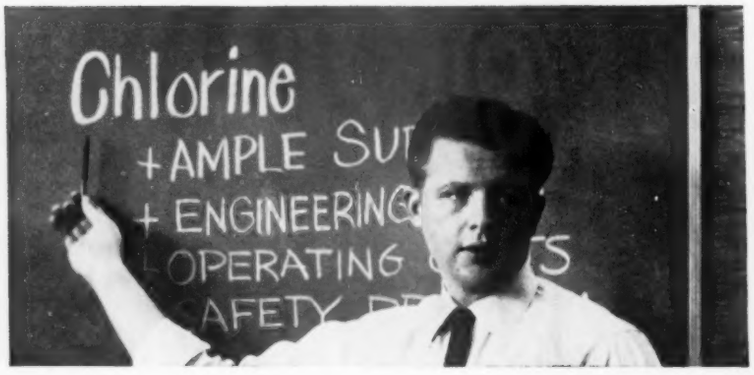

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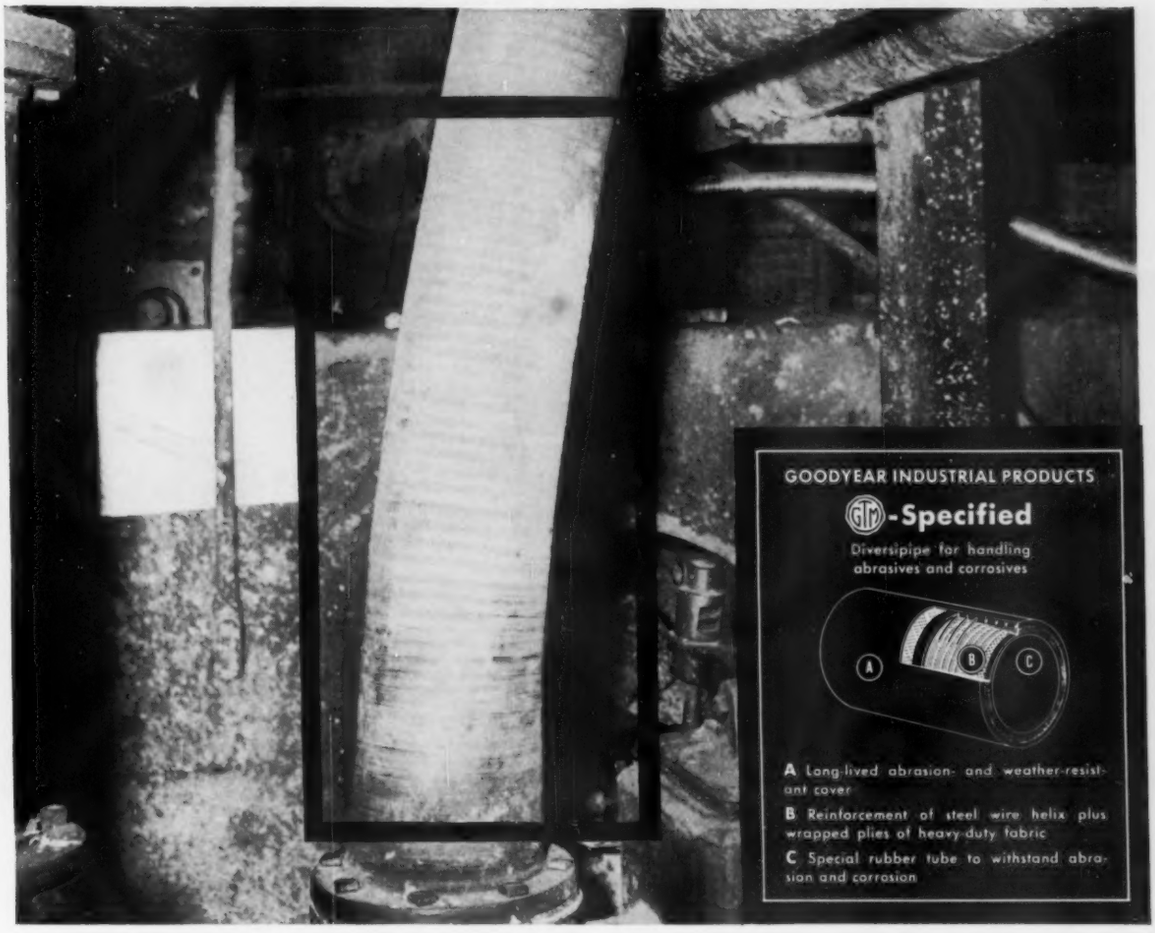
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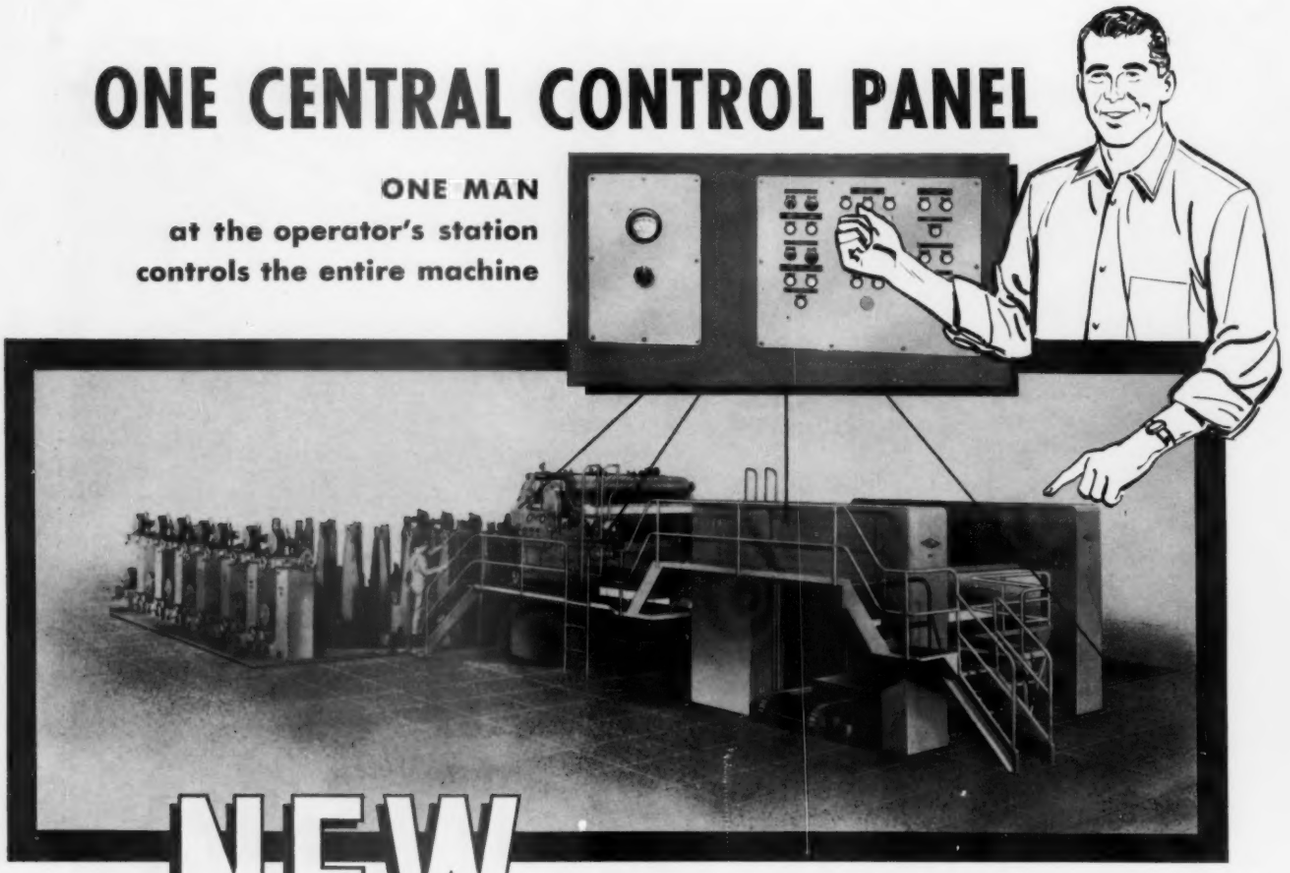

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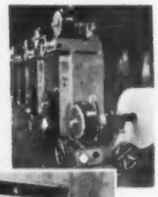

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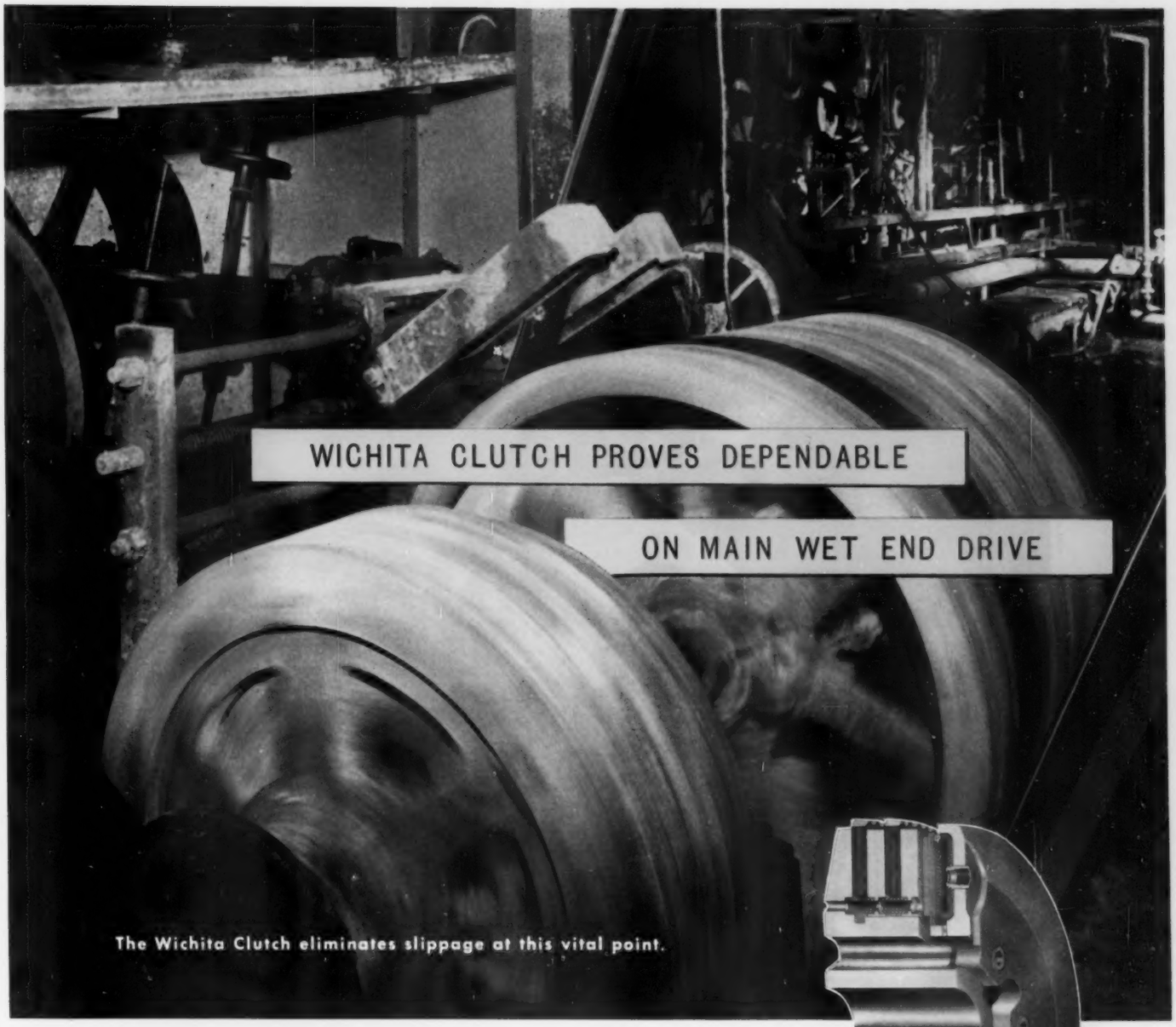

Wichita Clutches also chosen by Fleming & Sons, Inc. to lower maintenance on this calender drive . . . arrows point to cutter drive clutches

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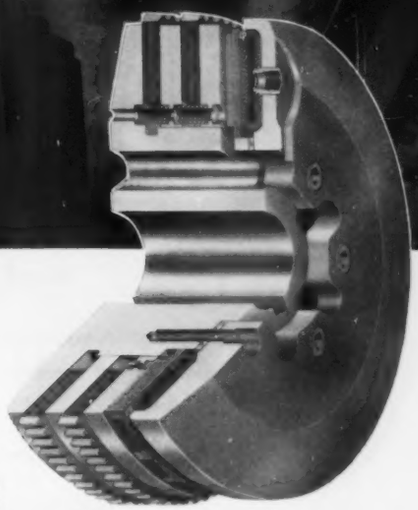

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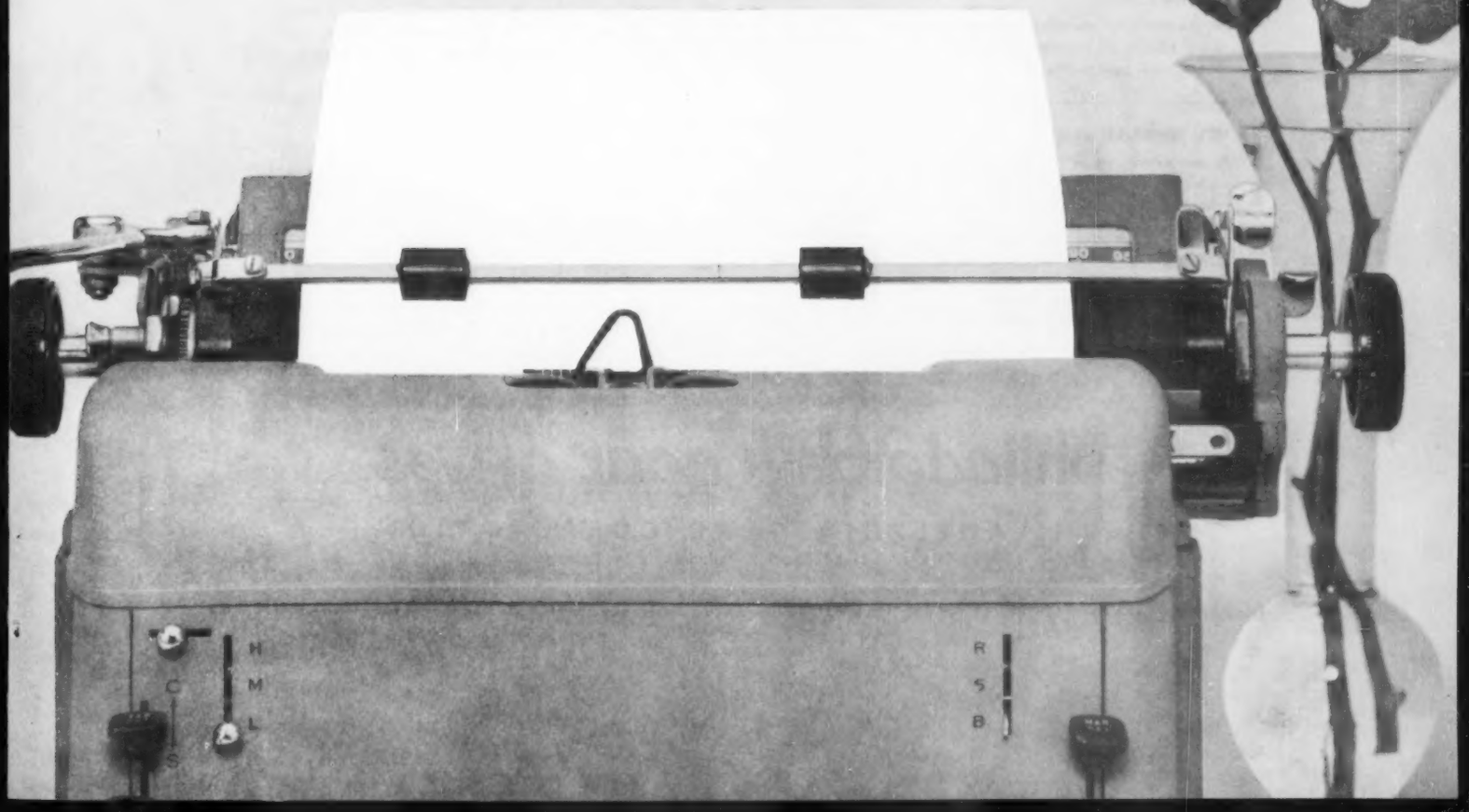

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For any application where low sound levels are important, gearing noise is no longer a controlling factor.

IMPROVE YOUR PRODUCT

Philadelphia precision gear drives may give your product the years-ahead competitive edge you've been looking for.

Write today for complete information

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PHILADELPHIA GEAR CORPORATION

Erie Avenue and G Street • Philadelphia 34, Pennsylvania

Offices in all Principal Cities • Virginia Gear & Machine Corp., Lynchburg, Va.

INDUSTRIAL GEARS & SPEED REDUCERS • LIMITORQUE VALVE CONTROLS • FLUID MIXERS • FLEXIBLE COUPLINGS

Acorn of the Eastern Red Oak

Best seller. . . 1989

This acorn may grow to be a tree which will be the source of paper for a best-selling book. It is likely that the paper will bleach whiter, and *stay* whiter—thanks to hydrogen peroxide from Shell Chemical.

In chip-groundwood pulp bleaching, hydrogen peroxide gives high brightness plus markedly increased reversion resistance. For, unlike other bleaches, the *higher* you bleach with hydrogen peroxide, the *greater* the resistance to reversion.

Other Shell chemicals, listed in the column at the right, help the paper and packaging industries produce better products that build lasting customer satisfaction.

The Shell Chemical Technical Service Laboratory—one of the nation's best equipped—will gladly help you solve your paper problems, from pulping to conversion. For prompt assistance, samples or technical literature, write to your nearest Shell Chemical district office.

- Epon® Resins
- Ethyl Alcohol
- Glycerine
- Hydrogen Peroxide
- Ionol® CP
- Isopropyl Alcohol
- Methyl Ethyl Ketone
- Methyl Isobutyl Ketone
- Urea

SHELL CHEMICAL CORPORATION

INDUSTRIAL CHEMICALS DIVISION

Atlanta • Chicago • Cleveland • Detroit • Houston • Los Angeles • Newark • New York • San Francisco

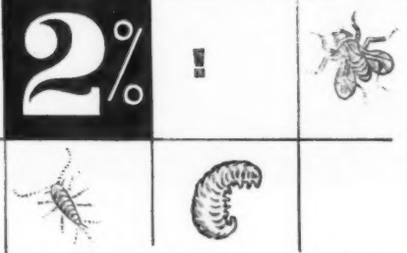
IN CANADA: Chemical Division, Shell Oil Company of Canada, Limited, Montreal • Toronto • Vancouver

SHELL

SULPHUR

ONE OF THE FOUR STRONG PILLARS OF PROCESSING

...BUT WHAT A 2% !



A recently compiled breakdown of Sulphur consumption in the United States, shows about 2% of the Sulphur goes into the manufacture of insecticides and fungicides.

Not much, perhaps, as tonnages go but no other use of Sulphur is more important with the possible exception of the 'wonder' drugs. It doesn't take much imagination to picture what would happen if the bugs and parasites were allowed to take over our crops and trees. Sulphur, along with other chemicals, is helping to protect our food supplies and foliage.

The role that TGS is playing in this constant fight against crop destruction is to see to it that the manufacturers of the insecticides and fungicides *always* have a ready supply of Sulphur, both solid and molten. This constant production and centralized distribution coupled with technical help is our contribution to industry.

SULPHUR PRODUCING UNITS

• Newgulf, Texas • Spindletop, Texas
• Moss Bluff, Texas • Worland, Wyoming
• Fannett, Texas

TEXAS GULF SULPHUR CO.

75 East 45th Street, New York 17, N. Y.
811 Rusk Avenue, Houston 2, Texas

Courtesy: Seiberling Rubber Company

Alpha® Protein ...

for crisp reproduction of a single color half-tone

Visual excitement can be a matter of black and white, as in the picture above where tonal gradations of a single color are vividly produced on paper processed with Alpha Protein.

Coatings made with Alpha Protein insure whiter, more opaque, smoother and more water-resistant printing paper. These qualities improve printability and add brilliance, depth and clarity to reproduction.

If you're not already using Alpha Protein in *your* coating operation you may be passing up an opportunity to cut costs and speed production. Alpha Protein means less drying time, allows faster machine speeds—in many cases has increased production 15 percent! Write or call for complete details.

CENTRAL SOYA COMPANY, INC.

Chemurgy Division

1825 N. Laramie Avenue • Chicago 39, Illinois

This advertisement reproduced on Alpha Protein-processed paper

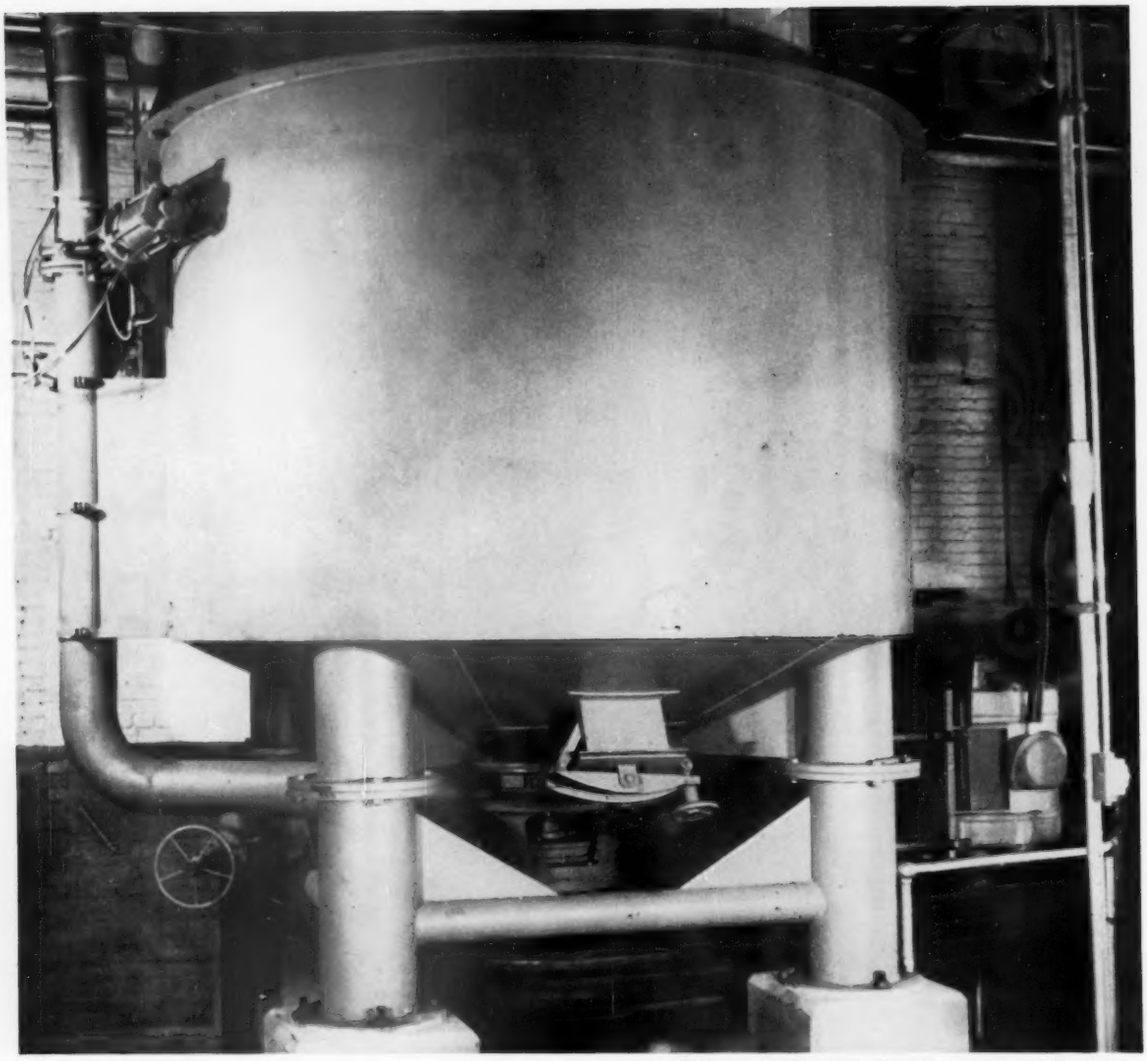


Photo courtesy Waterfalls Tissue Corp., Mechanic Falls, Maine

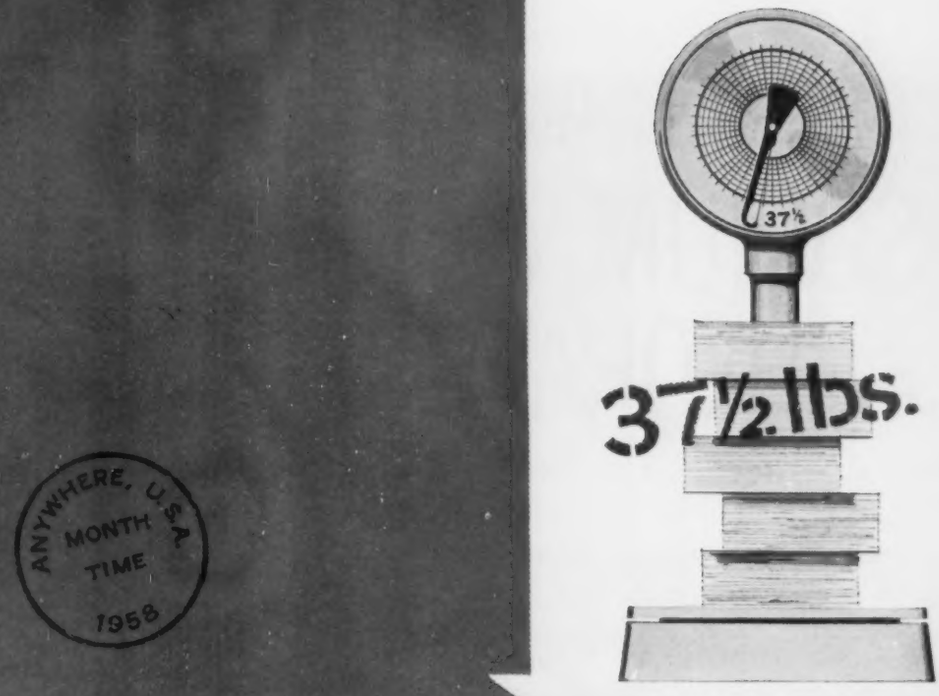
NEW SOLVO PULPER
AT WATERFALLS TISSUE CORPORATION
PULPING LEDGER STOCK

QUALITY — SPOT FREE
CONSISTENCY — 6.5% B. D.
TIME — FIFTEEN MINUTES

SIMILAR PERFORMANCES ARE OBTAINED ON WET STRENGTH TISSUE BROKE, HARD WHITE SHAVINGS AND TABULATING CARDS

IMPROVED MACHINERY INC.
NASHUA, NEW HAMPSHIRE

In Canada, Sherbrooke Machineries Ltd., Sherbrooke, Quebec



100 magazines, 100 pages each, weigh only 37½ lb when printed on 40 lb stock.

100 copies of same magazine, same number of pages, weigh 47 lb when printed on 50 lb stock.

POSTAL RATES GOING UP... YOU CAN HELP PUBLISHERS KEEP MAILING COSTS DOWN!

Opacity and printability are vital considerations when it comes to papers for periodicals. With low basis weight papers made opaque with UNITANE O-110, magazine publishers should enjoy critical weight savings with little or no effect on readability.

Here's how UNITANE O-110 does this job better! Its uniform particle size, high refractive index, maximum water dispersion and other excellent working properties provide the level of opacity which is preserved from dry sheet to printed page! On the other hand, an ordinary clay-filled sheet may have good opacity when dry, but will lose its opacity when printed, thus increasing the show-through.

Your low basis weight papers can profit from UNITANE O-110 . . . and you'll profit, too, when your papers can meet today's more exacting publishing demands. Ask your Cyanamid Pigments representative for specific recommendations as they apply to your papers. He'll gladly supply samples, too.

CYANAMID

AMERICAN CYANAMID COMPANY
Pigments Division
30 Rockefeller Plaza, New York 20, N. Y.

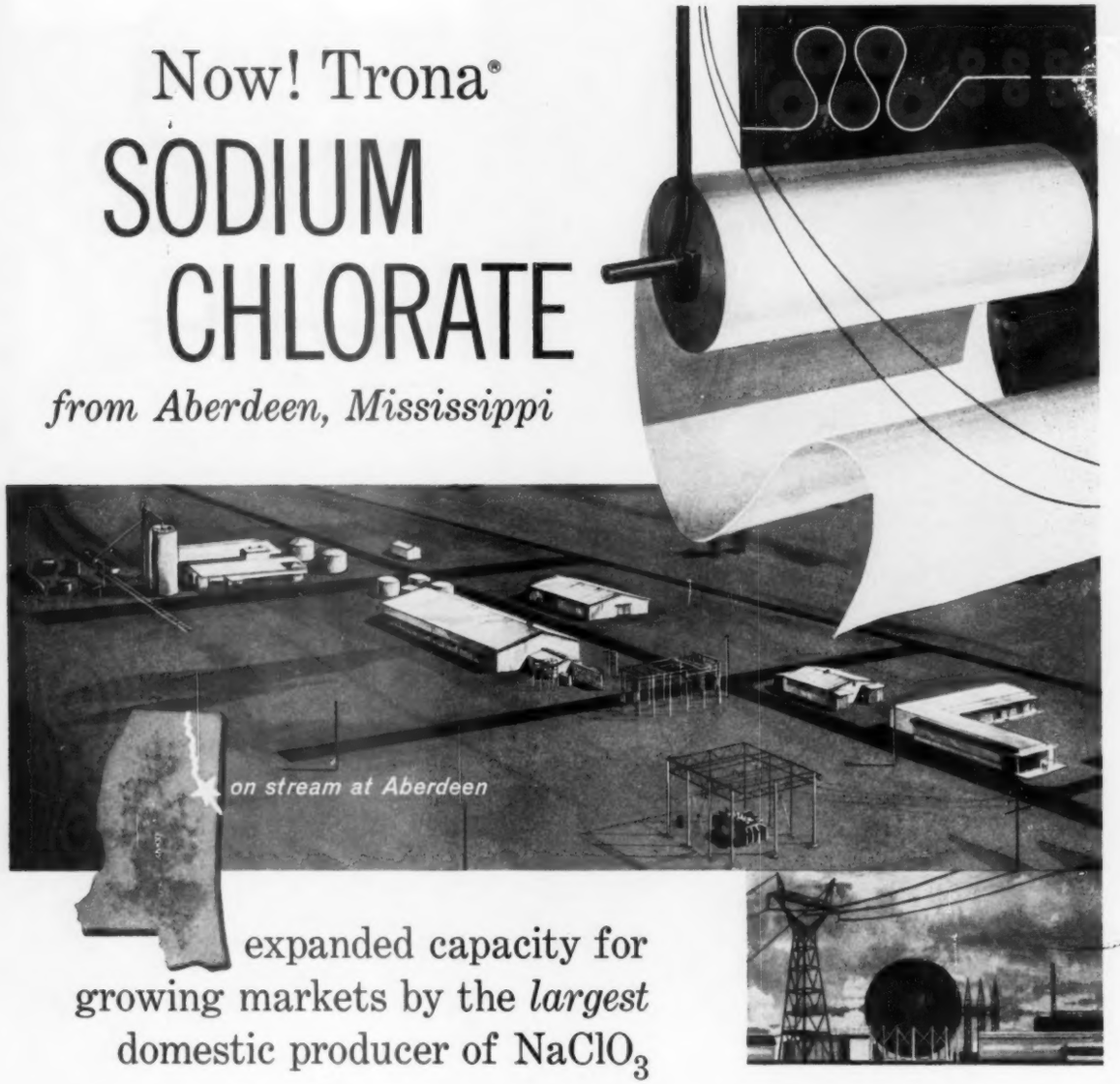
Branch Offices and Warehouses
in Principal Cities

UNITANE

Now! Trona®

SODIUM CHLORATE

from Aberdeen, Mississippi



expanded capacity for growing markets by the *largest* domestic producer of $NaClO_3$

The big news in sodium chlorate is TRONA's new electrochemical plant, now on stream at Aberdeen, Mississippi. This latest AP&CC facility provides faster and better service to the South's growing pulp and paper production centers, as well as further assurance of dependable sodium chlorate supply for other important markets in such fields as agriculture, uranium ore processing and solid propellant fuels. Aberdeen's readily expandable, initial capacity of 15,000 tons per year, added to the $NaClO_3$ production capability of Trona's Henderson, Nevada, plant makes American Potash & Chemical Corporation the largest domestic supplier of sodium chlorate...capable of meeting *all demands* from expanding commercial and military users. *Further information on Trona's sodium chlorate service and production capabilities at Aberdeen is available from your nearest AP&CC branch office.*

TRONA

American Potash & Chemical Corporation

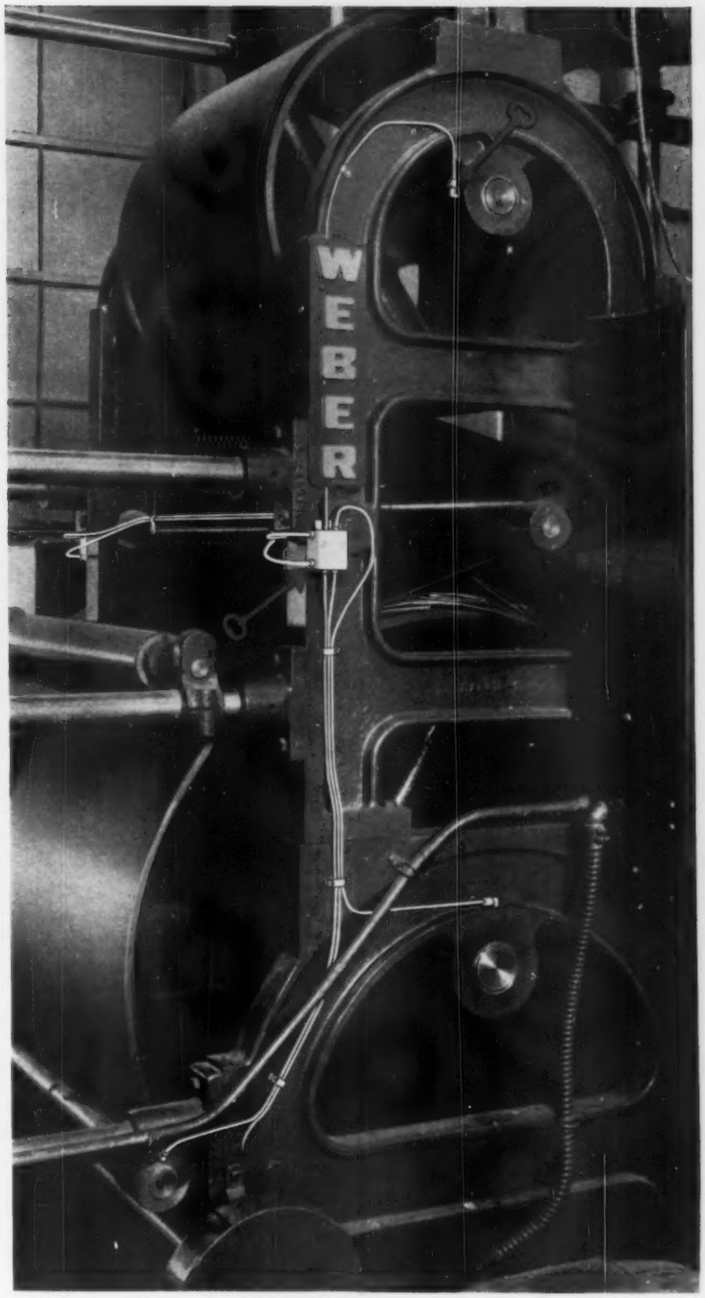
3000 WEST SIXTH STREET, LOS ANGELES 54, CALIFORNIA

99 PARK AVENUE, NEW YORK 16, NEW YORK

OFFICES: LOS ANGELES, NEW YORK, CHICAGO, SAN FRANCISCO, PORTLAND (ORE.), ATLANTA, COLUMBUS (O.), SHREVEPORT

Producers of: BORAX • POTASH • SODA ASH • SALT CAKE • LITHIUM • BROMINE • CHLORATES • PERCHLORATES • MANGANESE DIOXIDE
THORIUM • CERIUM • RARE EARTHS • *and other diversified chemicals for Industry and Agriculture*

Farval eliminates downtime, saves lubricant on Weber high-speed bag machine



FARVAL—Studies in Centralized Lubrication No. 219

THIS Weber Bag Making Machine at Bemis Bro. Bag Company's Vancouver, Washington, plant has been in continuous trouble-free operation for over 3 years. Its modern Farval system—continuously delivering measured amounts of lubrication at regular intervals—has eliminated all downtime due to either faulty lubrication or bearing loss.

Bemis Bro. Bag report their Farval system saves over 20% in lubricant required as well as contributing to the over-all cleanliness of the general work area. This is most important in the paper bag industry, because a dirty, stained product means rejects—lower profits.

Investigate how a Farval system can solve your lubrication problems. Write today for Revised Bulletin 26-S, The Farval Corporation, 3268 East 80th St., Cleveland 4, Ohio.

KEYS TO ADEQUATE LUBRICATION

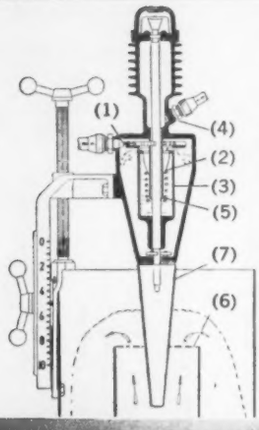
Wherever you see the sign of Farval—familiar valve manifolds, dual lubricant lines and central pumping station—you know a machine is being properly lubricated.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.

Precise regulation at any rate of flow

KÄLLE

THE HIGH PRECISION CONSISTENCY AND FLOW CONTROL SYSTEM



OPERATION

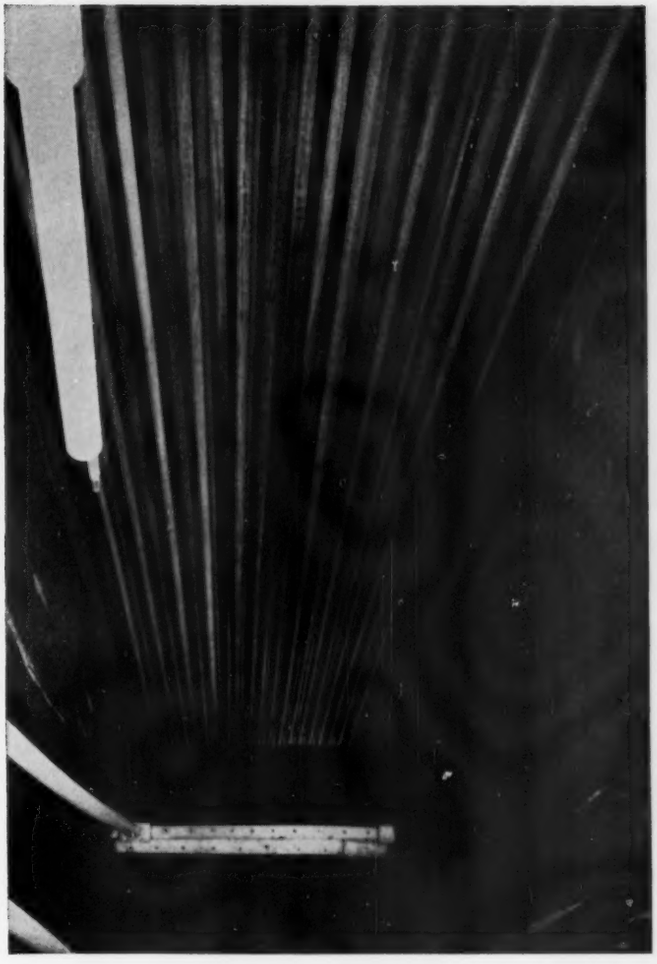
Water under constant pressure spins turbine (1) creating a vortex (2), whose depth is determined by the speed of rotation of the vessel (3). An air stream, introduced at (4), measures, through the bubble-pipe principle, the distance between (5) and the bottom of the vortex, thus determining the degree of consistency of the stock suspension (6) which exerts a friction drag on the whirling sensing element (7).

The heart of the Källe system is the Consistency Indicator pictured at left, a triumph of high-performance engineering. Having only one moving part, the Indicator is extremely rugged and maintenance-free, yet is capable of measuring consistencies between 0.5% and 6% with great accuracy. Information from the Indicator is transmitted to the Källe Controller which automatically adjusts dilution rate to conform with the required consistency...while the Källe Recorder keeps accurate record of dilution volume and consistency rate. The Källe system saves man-hours and improves efficiency in many of the world's leading pulp and fiber plants. Write for full information.

REPRESENTATIVES

ROSENBLAD CORPORATION
1270 SIXTH AVENUE, NEW YORK 20, N. Y.

PAPER MILL EQUIPMENT, LTD.
320 DOMINION SQ. BLDG., MONTREAL 2, QUE.



problem:

A chemical company, using a cold water heat exchanger to cool caustic soda and sodium hypochlorite, was being plagued by breakage in the 2" dia. glass tubing. Shutdowns occurred about three times monthly . . . each time consumed about 15 extra man-hours to change tubes . . . necessitated additional processing of contaminated hypochlorite.

solution:

A heat exchanger was fabricated from Carpenter Titanium Tubing. Ten-foot lengths of this tubing were vertically submerged directly in each caustic soda processing vat.

results:

Maintenance costs reduced nearly $1500 annually! No tubing failure since Carpenter Titanium Tubing was installed two years ago! Increased production! Improved product quality! With a heat exchanger in each processing vat instead of separate unit, pumps and pump plumbing previously required to transfer highly corrosive fluid, and maintenance problems connected with them, have been eliminated!

Carpenter Titanium Tubing tames corrosion . . . reduces costs

Why not take advantage of the corrosion and cavitation resistance, light weight and high strength of Carpenter Titanium Tubing? It is the *least expensive* tubing you can use under many corrosion influences. It withstands conditions that reduce service life of ordinary metal . . . assures minimum downtime, fewer replacements.

Three commercial grades—C40, C55 and C70—in tubing sizes up to 4½" O.D. are available.

In the food, chemical, pulp, paper and allied industries . . . the long, trouble-free service life of Carpenter Titanium Tubing provides countless opportunities to improve equipment performance and to reduce operating and maintenance costs. Contact your local Carpenter representative or distributor for the full story.

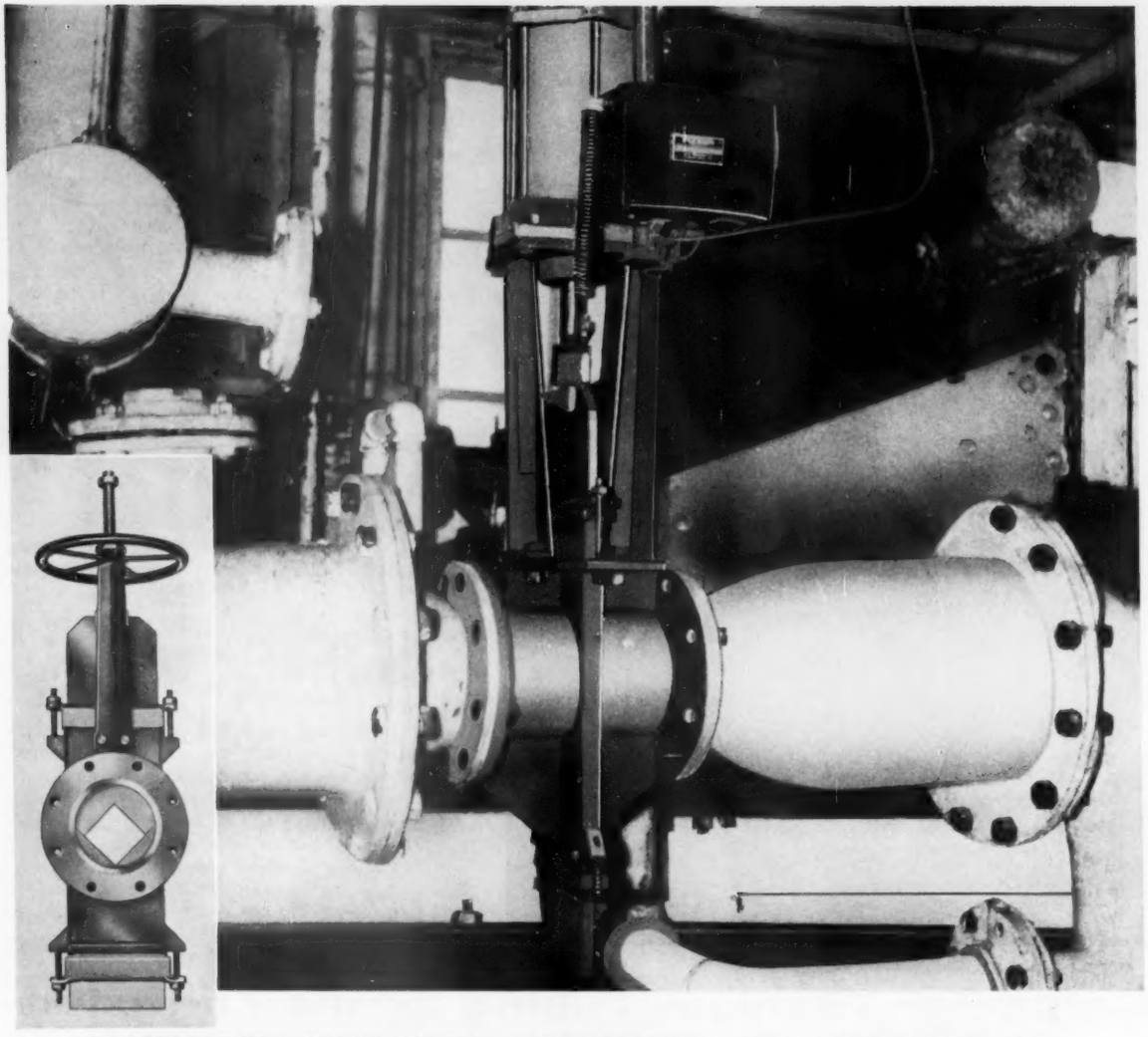
Write for Bulletin T.D. 115A. *Contains complete data on the properties, corrosion resistance and application benefits.*

your master key to cost-saving corrosion control

Carpenter

titanium tubing & pipe

The Carpenter Steel Company, Alloy Tube Division, N.J.



DEPENDABILITY WHERE IT COUNTS!

In operation at the Oregon Pulp and Paper Company, this 6" Veeport Metering Valve has proven it can do the job under extreme working conditions. This valve is located just after the Blow Pits and Knotter Chest and handles 410 G.P.M. of stock at four per cent consistency, knots, slivers, etc. The Veeport controls the level of a *small* consistency regulator chest (3' x 4' x 4') ahead of the knotters. Adding to these problems is the great reduction in pipeline size and also the fact that dilution water is added after the valve.

For a catalog showing the complete line of Fabri-Valves, simply mail the coupon.

FABRI-VALVE DISTRIBUTORS: ASSOCIATED INSTRUMENTATION & CONTROL, LTD., Montreal, Quebec • CORDES BROTHERS, Wilmington, Calif. • R. A. KINSMAN, Anaheim, Calif. • CORDES BROTHERS, San Francisco, Calif. • FELKER BROTHERS, Marshfield, Wis. • ZINN INDUSTRIAL SUPPLY CO., Lewiston, Idaho • THOS. W. MACKAY & SON, LTD., Vancouver, B.C. • LEE REDMAN EQUIPMENT CO., Phoneix, Arizona • SOUTHERN CORPORATION, Charleston, South Carolina

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FABRI-VALVE
COMPANY OF AMERICA
2100 N. Albina Avenue
P. O. Box 4353 Portland 8, Oregon

Name_____ Position_____

Company_____

Address_____

City_____ Zone____ State_____

Which of these 3 products and services can you use from BECCO?

"Enclosing $1.00 — Send Patent License"

Well, perhaps there's a little more to your gaining use of Becco patents than just mailing your dollar in, but not much more. And certainly, no more money. The $1.00 really does cover it.

Becco has lots of patents, granted as a result of innovations in the use of Hydrogen Peroxide and other Peroxygen chemicals developed in Becco's Research Laboratories. But they don't do us a whole lot of good locked tightly in our safe. So, we long ago adopted the following policy:

If one of our patents can help you, we'll be glad to license the rights to you **perpetually**, for just one dollar. You get a nice certificate, incidentally, to cover the legalities, but more important – you also get free our complete engineering help in setting up your process, handling the material, maintenance, etc., etc.

What do **we** get? You as a **customer** – we hope – but there's no obligation on your part. Just seems to work out that way, though – when we know enough about a particular peroxygen to hold a patent on its use, chances are we've also learned enough to produce it purer than anyone else. You benefit from this; we do, too.

Use the coupon below to ask for a Sales Engineer – or our list of patents – that may help you solve an important problem.

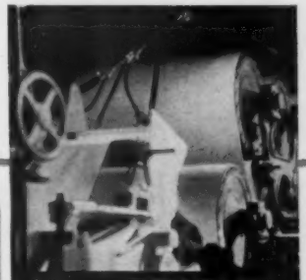
BECCO fmc

BECCO CHEMICAL DIVISION, FMC
Station B, Buffalo, New York
Dept. PP-F

Gentlemen:
Please send your list of patents available on the use of

- ☐ Hydrogen Peroxide
- ☐ Peroxygen Chemicals
- ☐ Persulfate Chemicals
- ☐ Please have a Sales Engineer call.

NAME_____
FIRM_____
ADDRESS_____
CITY_____
ZONE____ STATE_____



How BRIGHT Is BRIGHT?

That's a hard question to answer. It depends on how the pulp is treated.

Trouble is, paper can show an 86 level at the layboy, but by the time the paper is delivered, this has dropped to 82 or lower. With conventional bleaching methods, that is.

Many chemical pulp producers have found the answer to this problem in Becco's Dryer Steep Bleaching Process (patented, but licensed perpetually for one buck). Applied by means of spray pipes across the pulp sheet ahead of the dryers, Becco Hydrogen Peroxide increases brightness permanence and bleaches in transit. Often, in fact, an 86 layboy level **improves** to 88 by delivery time.

This is just one example. Becco has a vast amount of technical knowledge compiled from 31 years of experience with **all** types of pulp. If **you'd** like help with your pulp, free of any obligation, let us know with the coupon below.

BECCO fmc

BECCO CHEMICAL DIVISION, FMC
Station B, Buffalo, New York
Dept. PP-C

Gentlemen:
We **would** like help with our pulp. Please have a Becco Sales Engineer call.

NAME_____
FIRM_____
ADDRESS_____
CITY_____
ZONE____ STATE_____

Problems in handling Hydrogen Peroxide

?

Becco's Four-Fold Engineering Service Program—offered free—includes:

1. Comprehensive survey of your facilities.
2. Specific proposal with recommendation of proved equipment and where it is obtainable.
3. Installation supervision by Becco.
4. Periodic inspection and permanent service.

Can you use this free Becco help, based on more years of experience with bulk handling of H_2O_2 than any other manufacturer? Use the coupon to let us know.

BECCO fmc

BECCO CHEMICAL DIVISION, FMC
Station B, Buffalo, New York
Dept. PP-B

Gentlemen:
Please tell me more about your Four-Fold Engineering Service.

NAME_____
FIRM_____
ADDRESS_____
CITY_____
ZONE____ STATE_____

bright stars in the paper
industry...from STEIN HALL
LYCOID®
(Galacto Mannan)
SUPERFILM®
(Modified
Corn)
SUPERSIZE
(Hydroxyethyl
Ethers)
RESINS
HALLMARK®
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(Coating Dextrine)
CALENDER SIZE G
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Colloids)
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(Corn for
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NATURAL GUMS
(Karaya, Guar,
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Serving the Industry with 18 Branch offices
strategically located throughout the United States and Canada.
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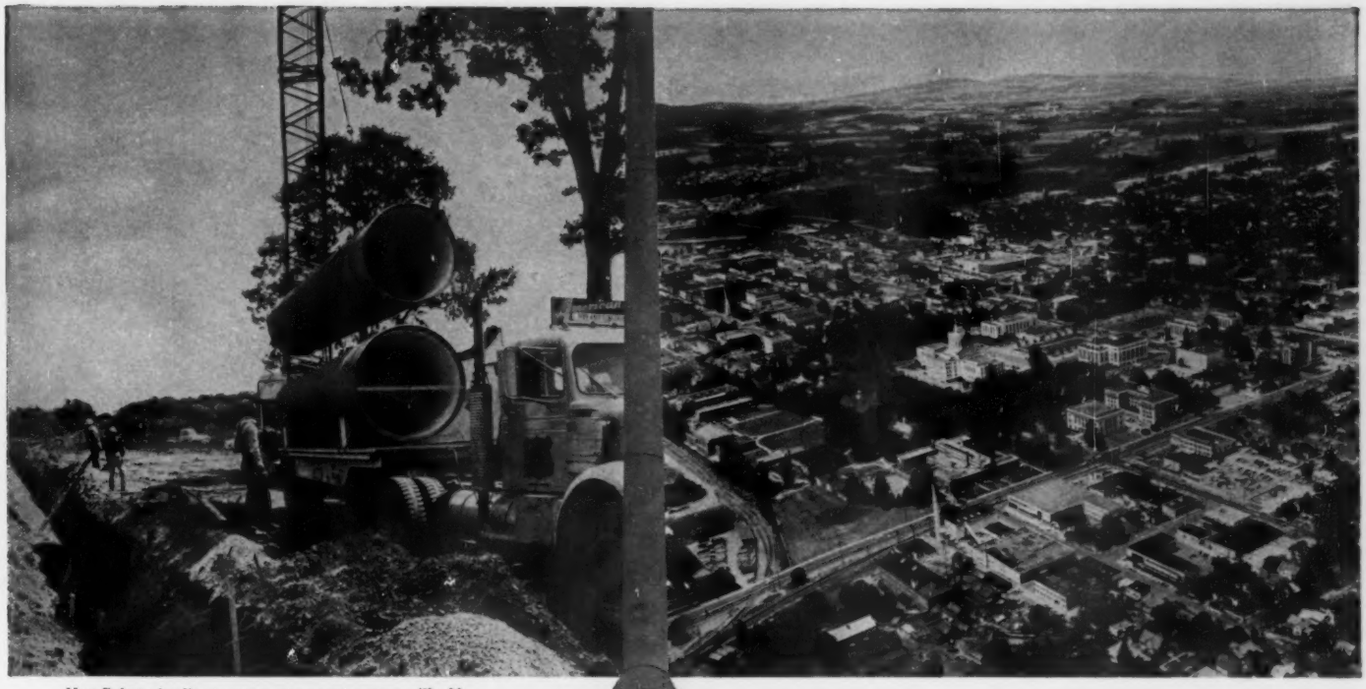


New Salem pipe line to augment present system will add approximately 50 MGD capacity to city water supply system.

a line of growth... for Oregon's capital city

American Concrete Cylinder Pipe is helping Salem, Oregon to grow

A simple but important fact is that no city, however great its potential, can grow beyond the capacity and dependability of its main water supply system.

Recognizing this fact, and envisioning a population in 30 years that will require three times the maximum capacity of present water transmission lines, Salem, the capital city of Oregon, is carrying out a program designed to meet future needs.

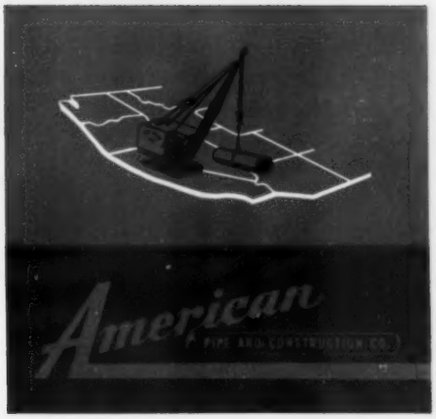
Under the direction of the City's Water Department Manager, John L. Geren, and the technical supervision of Consulting Engineers Clark and Groff of Salem, an 18-mile pipe line of 48" and 54" diameter American Concrete Cylinder Pipe is being installed by Lord Brothers, a general contracting firm of Portland, Oregon. This new line will triple the present capacity of the supply system.

The performance record of this type of reinforced concrete cylinder pipe has been so outstanding throughout the West that Salem can be confident that this water "growth line" will be giving efficient, economical service for many, many years to come.

Strength, permanence, sustained high carrying capacity, and trouble-free service are characteristics of American Concrete Cylinder Pipe which make it the right pipe for this forward looking city.

When planning your future water "growth lines," look to American's quality pipe line products, extensive production facilities and half century of experience.

Ask for complete information concerning the particular class of pipe that will meet your design requirements.



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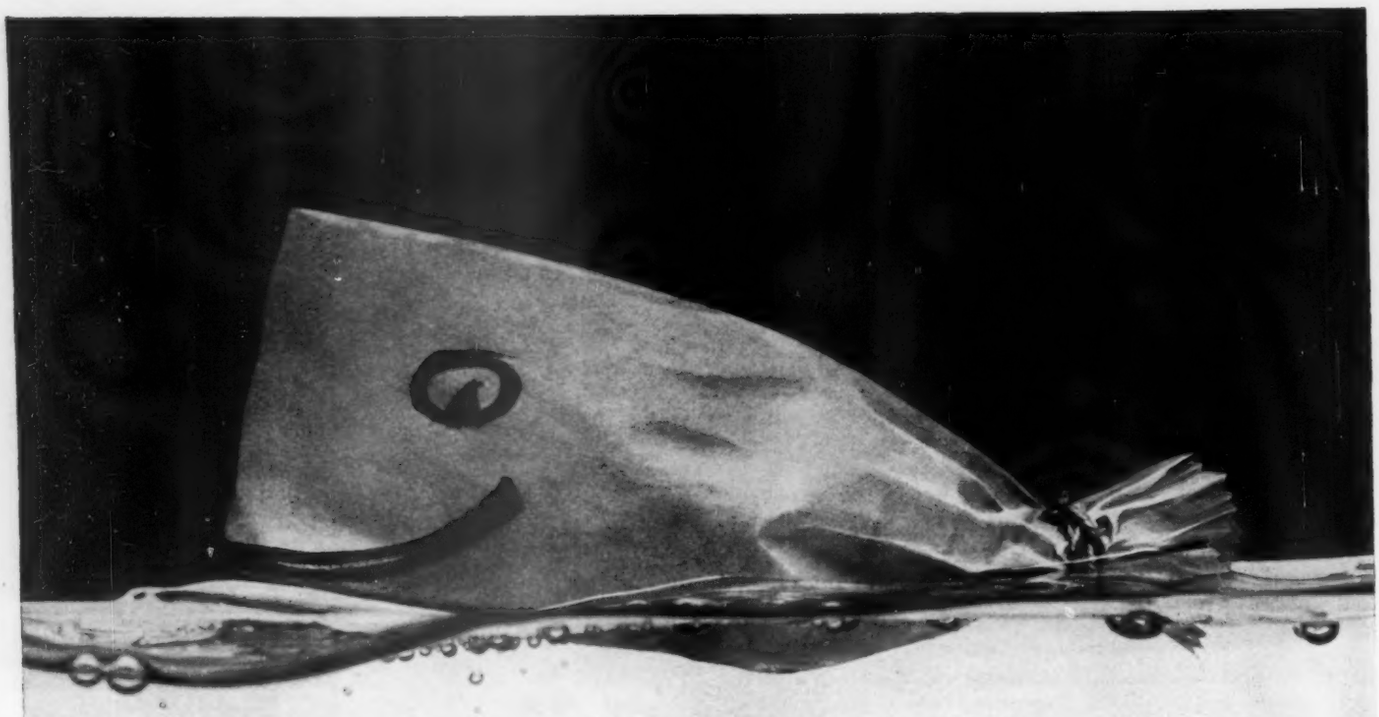


this paper was treated with

SCRIPTITE* 33

A melamine resin supplied as a finely divided dry powder, Scriptite 33 imparts high wet strength to many paper products. Count on Scriptite 33 to increase dry tensile strength and wet rub resistance . . . to improve dry Mullen, wax pick, internal size efficiency, and dry stiffness. Scriptite 33 produces papers with strong fold endurance. For laboratory samples of Scriptite 33 and technical bulletin, write Monsanto Chemical Company, Plastics Division, Room Springfield 2, Mass.

Monsanto

*SCRIPTITE: Reg. U.S. Pat. Off.

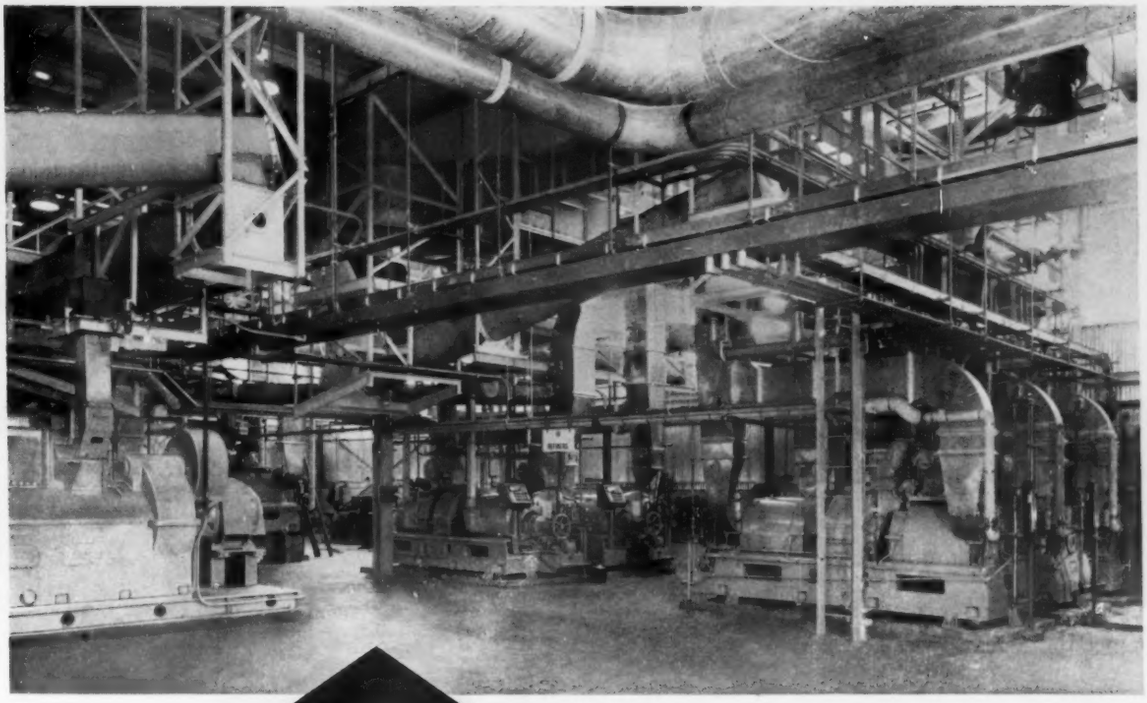
The Monsanto line of paper resins also includes

SCRIPTITE 40 ... *a urea type wet-strength resin.*

SCRIPTITE 50 ... *for unsurpassed printability and improved surface characteristics on boxboard.*

SCRIPTITE 52 ... *in combination with formaldehyde to give water resistance to folding boxboard and to jute liner.*

SCRIPTITE 54 ... *for outstanding water resistance and both wet and dry rub resistance.*



Bauer double revolving disc refiners and Pressafiners, a portion of the Bauerite equipment installed at Diamond Gardner's pulp mill in Red Bluff.

ANOTHER

Bauerite

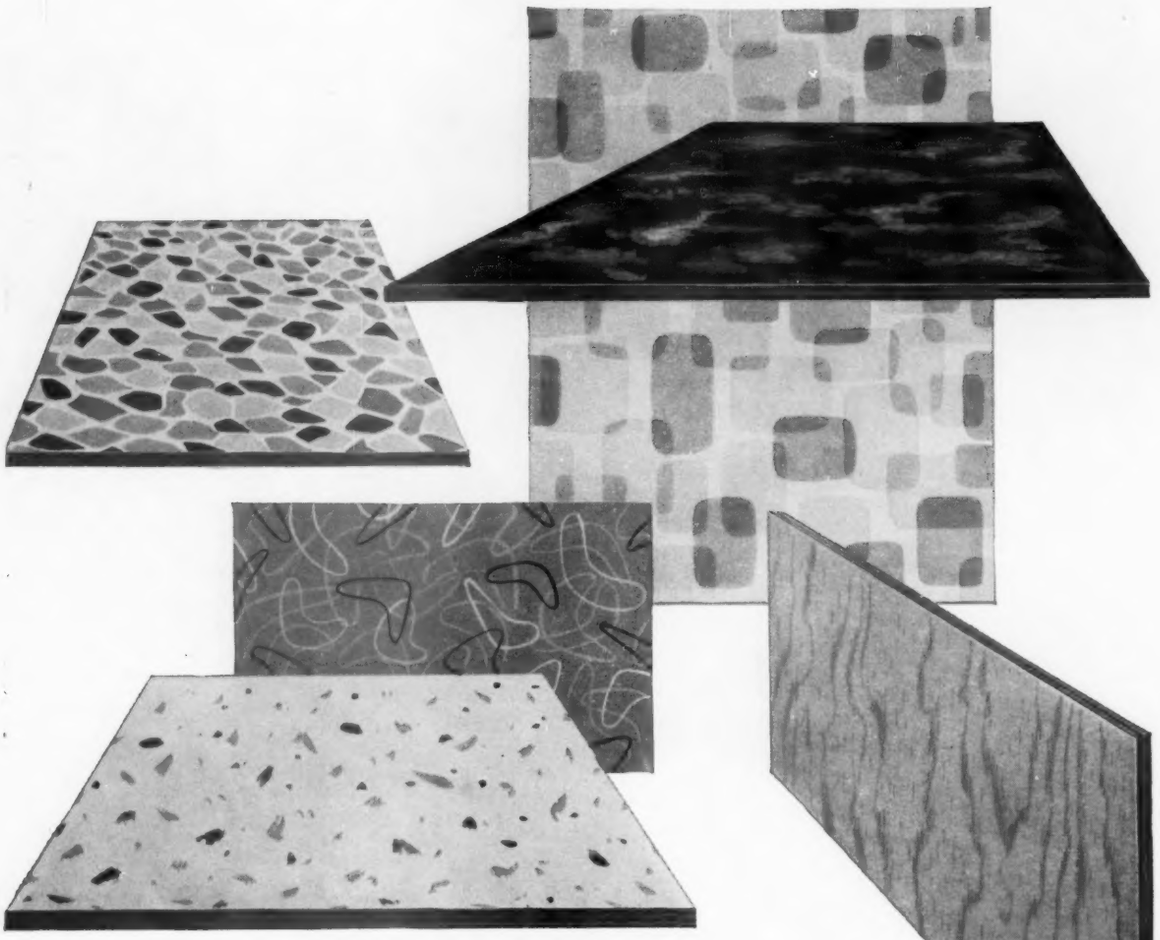
INSTALLATION

High wood utilization keynotes the ultra new Diamond Gardner Plant at Red Bluff, California. The integrated pulp mill produces molding pulp with the Bauerite Process of making groundwood pulp from chips.

One of the advantages of this process is its ability to utilize locally available raw materials. This includes residue from wood processing operations, as well as species of wood suitable for conventional grinding and many species formerly considered unsuitable.

The Bauerite Process opens new horizons in two ways. It can breathe new life into mills faced with a dwindling supply of regularly used raw materials. On the other hand, it also permits location in new areas, closer to markets being served. May we send you more information?

The Bauer Bros. Co., 1706 Sheridan Ave., Springfield, Ohio



CONTROLLED ABSORBENCY FOR LAMINATE DECORATIVE SHEETS WITH SOLKA® PULP

Manufacturers of decorative sheets for high pressure laminates find Solka Pulp ideal for the purpose. Paper made from these specially blended Solka fibres has an excellent printing surface and high dimensional stability. And of utmost importance, this paper has a uniform absorbency rate and capacity for saturants.

In addition to the standard grades, Solka Pulps can be tailor-made to give specific properties to papers designed for particular applications.

Brown Company's sixty years of pulp making experience is backed by top-flight research and technical personnel. This, plus modern manufacturing facilities, can help you in solving your problems. Write our Boston office today. Address Department PC-4.

Another Quality Product of BROWN COMPANY

150 Causeway Street, Boston 14, Mass.
Mills: Berlin and Gorham, New Hampshire

FLEXIBLE

Jones Stockmaster

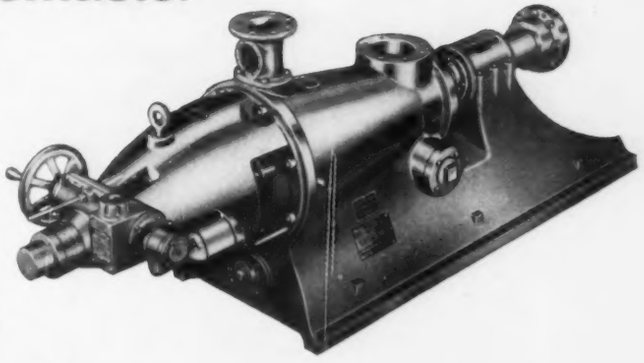
Wide selection of tackle, combined with suitable rotor speed, stock flow, consistency and stock pressure, provides complete flexibility in achieving desired results. Low in initial cost. Simple to maintain. Details in Bulletin EDJ-1047.

Extended motor base available at extra cost.

CONTROLLABLE

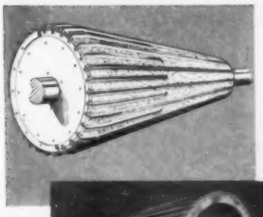
Jones Fibremaster

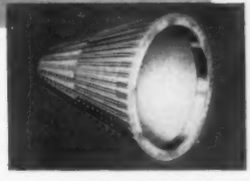
Close control of stock characteristics is assured in *all* Jones conical refiners through variety of tackle and highly accurate plug adjustment mechanisms. Split small heads facilitate dismantling. Fibremaster model is ideal general utility unit. Bulletin EDJ-1035A.



ADAPTABLE

Jones Adapta-Plug and FULBAR Shell Fillings

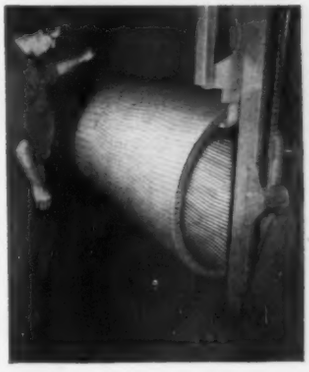




FIT ANY JORDAN

Adapta-Plug is the strongest, simplest Jordan plug made. Completely bandless. Easiest to strip and fill. Available as solid plug — or in sleeve form for easy rejuvenation of old worn plugs. Bulletins EDJ-1094 and 1094A.

Fulbar Shell Fillings are available in *any* bar combination and *any* bar material for *all* makes of Jordans. Easiest-to-install, rigid, one-piece construction. Famous Nowave design. Bulletin EDJ-1094.



DEPENDABLE

E. D. JONES CORPORATION

Pittsfield, Massachusetts

Member of the Beloit Group

PAPER MAKING Jones MACHINERY

Jones equipment is sold in Canada by The Alexander Fleck, Ltd., Ottawa • Overseas Export Agents: Castle & Overton, Inc., New York 20, N. Y. • Foreign Licensees: France — Batignolles-Chatillon • Italy — de Bartolomeis • Spain — Gabilondo • Japan — Mitsubishi Heavy Industries.

West End "fills the order" for free-flowing salt cake

TO PLANT. JMA JC JVM WS
NEW CUSTOMER REQUIRES 400 TONS* SALT CAKE
99.5 PERCENT IN BULK COVERED HOPPERS*
DELIVERED JACKSONVILLE FLA. JULY 7 FOR
START-UP. FUTURE REQUIREMENTS PROBABLY
200 TONS PER WEEK* INFO ONLY. SCHEDULE
FOLLOWS. END.
TO OFFICE.
CAN DO. WILL USE 9 DAY TRANSIT. WILL
SHIP 2 CARS TODAY AND BALANCE OF FIRST
400 TONS TOMORROW.

Storage for 25,000 tons of industrial chemicals

Immediate shipment in leased hopper cars

Vast natural source of raw material

Meeting service requirements to the letter and producing superior salt cake of consistent chemical analysis are the essentials to which the West End organization is uniquely geared. A system of rapid communications linking our sales office in Oakland with our production, technical and shipping departments at the desert plant site permits each department head to have a complete understanding of the customer's individual requirements and to make firm commitments or provide the desired information promptly.

WEST END

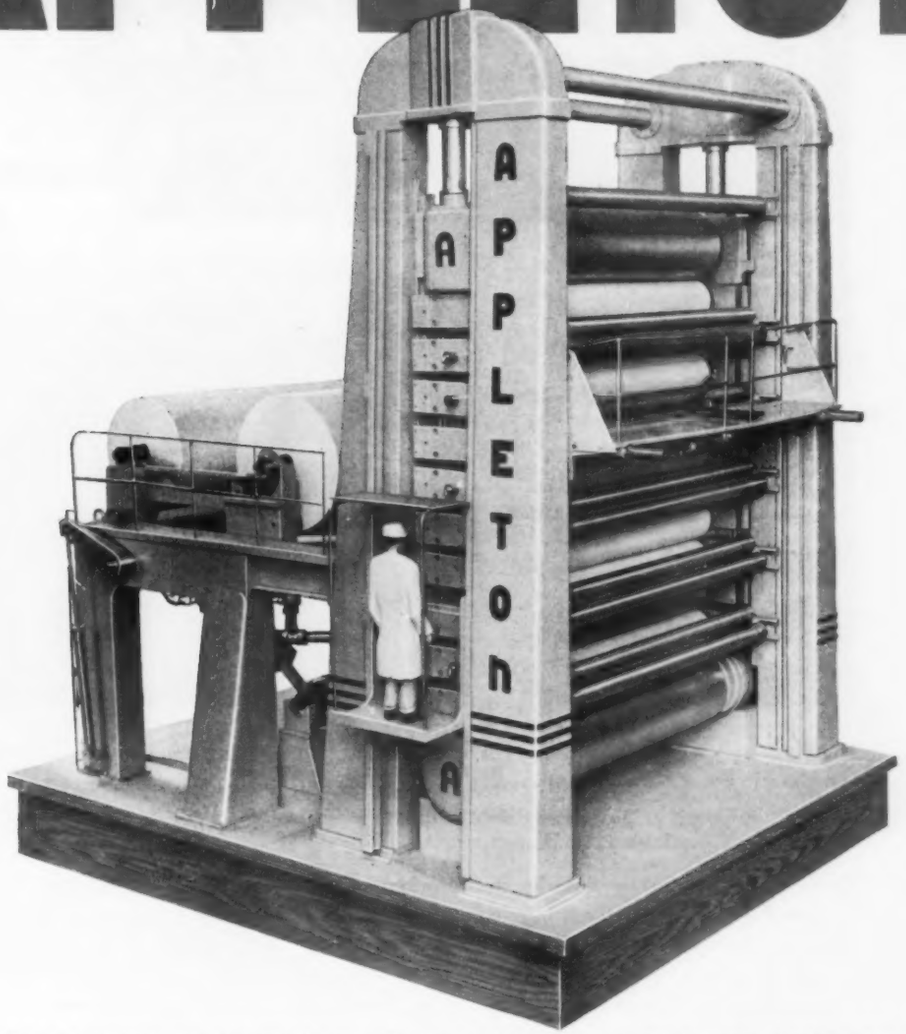
Stauffer

WEST END CHEMICAL COMPANY

DIVISION OF STAUFFER CHEMICAL COMPANY

EXECUTIVE OFFICES, 1956 WEBSTER, OAKLAND 12, CALIF. • PLANT, WESTEND, CALIF.

APPLETON



This is a model of Appleton's new high-speed supercalender. For the first time in the industry, Appleton has combined the advantages of a 4-column supercalender with the roll removal features of an open-face stack. At the same time, this revolutionary Appleton design eliminates many of the difficulties inherent in an open-face stack – couching of rolls, necessity of shuttling auxiliary rolls to change filled rolls. NEW APPLETON HIGH-SPEED SUPERCALENDER FEATURES: In addition to the many advanced features standard on all Appleton stacks, this new high-speed supercalender has: **All parts accessible by lifts and elevators . . . Filled rolls removed from back of stack onto full length elevators . . . Stack with semi-automatic parent roll handling and empty spool transfer to windup . . . Windup with semi-automatic spool handling and wound roll transfer . . . Calender roll housings maintained in vertical alignment by columns . . . Housings equipped with retractable ball-bearing casters riding in ways . . .** Perhaps this new high-speed supercalender can prove profitable to your operation. We invite you to write for complete technical data.

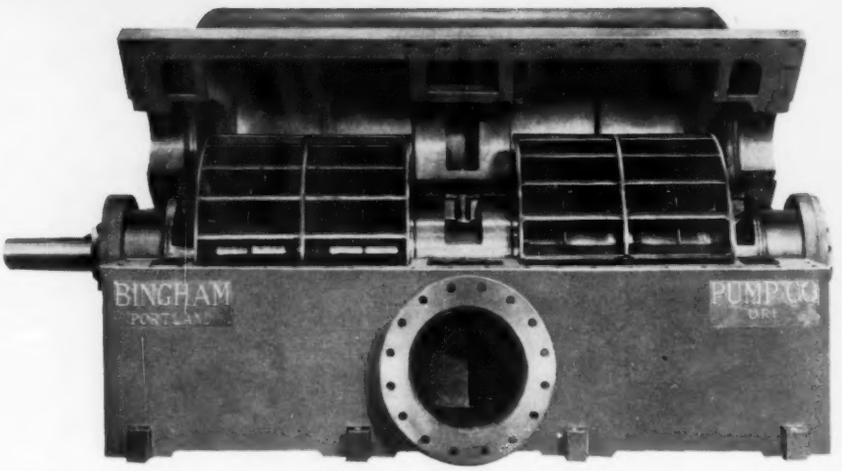
APPLETON MACHINE COMPANY
APPLETON, WISCONSIN

Bingham HIGH SPEED VACUUM PUMPS

SPLIT- High for Easy

Advanced Features:

- **Split Case for Easy Inspection**
- **Smaller Floor Space Required**
- **No Metal-to-Metal Contact Between Rotating and Stationary Parts — Low Maintenance**
- **Higher Efficiency — Lower Power Cost**
- **Quiet Operation — No Drumming or Vibration**
- **Higher Operating Speeds — Lower Driver Costs**



The Bingham Vacuum Pump, because of its double-suction hydraulically-balanced runner operating in an elliptical casing, produces a steady, non-pulsating vacuum—thereby insuring excellent performance characteristics.

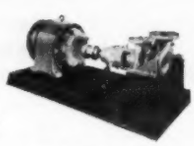
The horizontally-split case of the Bingham Double Suction Vacuum Pump is a marked advance in vacuum pump design, as it eliminates the drumming usually associated with vacuum equipment. Also, with this design, the rotating element may be easily inspected by unbolting the cover section at the flange. This exclusive Bingham feature also permits the rotating element to be removed vertically as a unit... eliminating the necessity of floor space for endwise removal of the shaft or any other rotating part.

Sealing between rotating parts is accomplished by a constant flow of sealing liquid which is supplied by the pump when operating. Bingham Vacuum Pumps are designed to operate at high speeds, directly connected to drivers, resulting in substantial reduction of driver and installation costs. The advanced design and rugged construction of Bingham Vacuum Pumps guarantee long life, high efficiency, and satisfactory performance with minimum maintenance. Call your nearest Bingham office, or write for Bulletin 16.

BINGHAM PUMPS DESIGNED

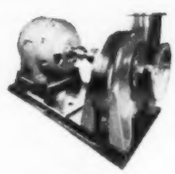
Bingham Type VS Double-Suction "Double Volute" Pump for stock and white water

Bingham "PULP HOG" for Decker, Washer or Thickener

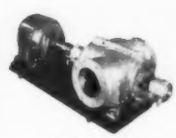


Bingham Type CAD Single Stage, "Double Volute" Process Pump

Bingham Type HLTL High Capacity, Low Head, Circulating Pump mounted on a "FLOATING BASE"



Bingham FAN PUMP Type HLVM

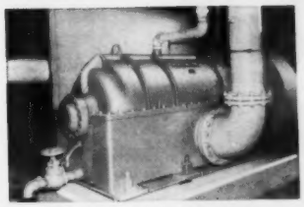


The Bingham "COMBER" for distribution of chemicals to pulp fibres

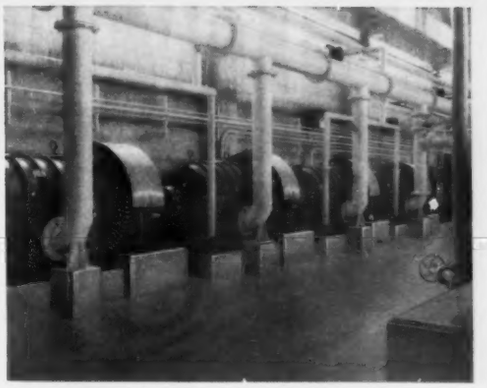
CASE DOUBLE-SUCTION

Speed Single and Multi-stage Units

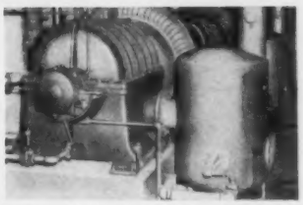
Accessibility, No Drumming, Low Driver Costs



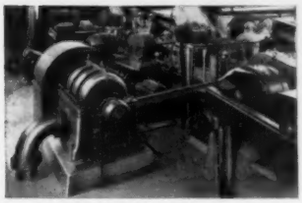
One of a group of large Split-Case, Multi-Stage, Double-Suction, Bingham Vacuum Pumps at Alaska Pine and Cellulose Pulp Mill, Port Alice, B. C.



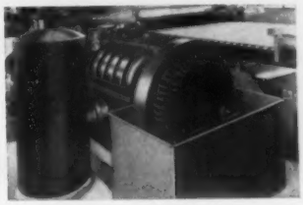
Battery of Bingham Split-Case, Double-Suction, Vacuum Pumps installed at MacMillan & Bloedel Mill, Harmac, B. C.



A group of Bingham Split-Case, Double-Suction, Vacuum Pumps in a large southern pulp mill.



A typical machine room installation of a Bingham Split-Case, Double-Suction, Vacuum Pump in a large western pulp mill.



One of several Bingham Split-Case, Double-Suction, Vacuum Pumps in Weyerhaeuser Company's pulp mill, Everett, Wash.

Partial List of Pulp and Paper mills using Bingham Vacuum Pumps

Alaska Pine and Cellulose Company
American Potash and Chemical Company
Canadian Forest Products, Ltd.
Crown Zellerbach Corporation
Everett Pulp and Paper Company
Hammermill Paper Company
International Minerals & Chemicals Co.
MacMillan & Bloedel, Ltd.
Powell River Company, Ltd.
Rayonier, Incorporated
Scott Paper Company
Soundview Pulp Company
Weyerhaeuser Timber Company

Bingham SINCE 1921 PUMPS — DOUBLE VOLUTE — RADIAL BALANCE

BINGHAM PUMP COMPANY
General Offices: **2800 N. W. Front Avenue, Portland 10, Oregon**
Factories: **Portland, Ore. • Vancouver, B. C., Canada**

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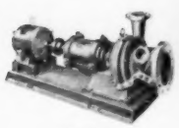
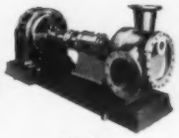
NEW ORLEANS, LA.
NEW YORK CITY, N. Y.
PHILADELPHIA, PA.
PITTSBURGH, PA.
SAN FRANCISCO, CALIF.
SEATTLE, WASH.
ST. LOUIS, MO.
ST. PAUL, MINN.
TULSA, OKLA.
TORONTO, ONT., CAN.
VANCOUVER, B. C., CAN.

ESPECIALLY FOR PULP AND PAPER MILLS



Bingham Type ARP Angularly Split-Case Stock Pump



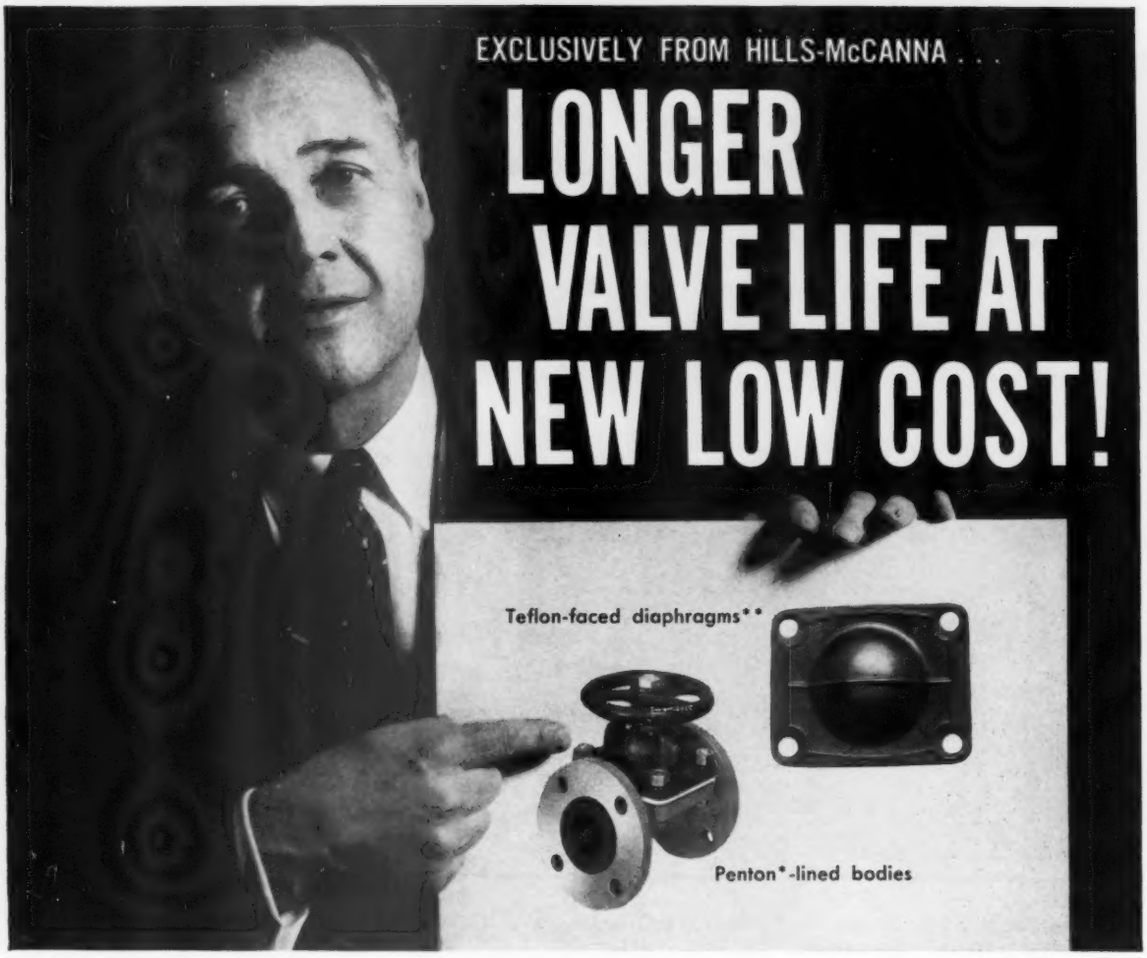
Bingham Foam Liquid Pump for handling liquids with entrained air or foam

Bingham "Double Volute" Digester Circulating Pump mounted on "FLOATING BASE"

Bingham Type MSB "Double Volute" Multi-Stage Pump for Log Barker and other high pressure services

Bingham EVEN-FLO Pump for screen transfer, seal pits, mill sewage, waste liquor sumps

Bingham Type HPD "Double Volute" Multi-Stage Double Case "HI-PRESS" Pump for extremely high pressure service



Hills-McCanna Diaphragm Valves—lined with Penton plastic and equipped with one-piece Teflon-faced diaphragms—are ushering in a whole new era of extra valve life and lower valve costs.

PENTON-LINED VALVES are suitable for operating temperatures up to 300°F. Penton-lined valves will save you money because they meet many service requirements that formerly called for costly stainless steel or glass-lined bodies—yet are competitively priced with rubber-lined valves. In addition to having superior corrosion resistance, they are non-contaminating—cannot affect a product's taste, aroma, or color—work equally well with metallic, plastic, glass or lined piping.

TEFLON-FACED DIAPHRAGMS are suitable for temperatures up to 240°F. They can handle concentrated sulphuric or hydrochloric acids, chlorinated hydro-carbons, and esters. The Teflon facing is permanently bonded to an elastomeric backing—provides long life, assures positive closure. Teflon-faced diaphragms save you money because they often meet the same service requirements as solid Teflon diaphragms at much lower cost.

*Penton is a registered tradename of Hercules Powder Company.
**Patent applied for. †Teflon is a registered tradename of E. I. Dupont.

FIND OUT HOW TO MAKE BIG COST-SAVINGS with packless, drip-tight Hills-McCanna Diaphragm Valves. See how these simplest-of-all valves can help you make important savings. Ask for new Bulletin 115 today.

HILLS-McCANNA COMPANY
4624 West Touhy Avenue • Chicago 46, Illinois

Manufactured and Distributed in Canada by International Equipment Company

hills-mccanna company
THE PEOPLE WHO KNOW AND CONTROL FLOW

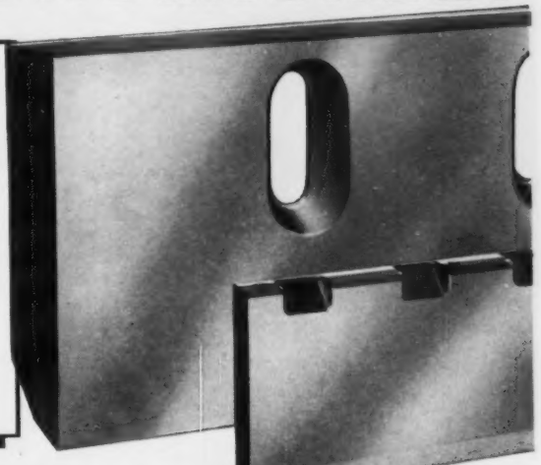
Your Work is Cut Out for You- **DEPENDABLY, QUICKLY, ECONOMICALLY**

-with SIMONDS

T-18 Chipper Knives

More Chips in Good Shape!

For more usable chips and less waste dust, get Simonds T-18 Steel Knives. They're made extra tough to take high speeds and heavy cuts without cracking or chipping out. They hold a sharp cutting edge *hours longer* — produce uniform chips *hours longer.*



-with SIMONDS

RED STREAK Paper Knives

Their Keener Edge Stays Sharp Longer!

Simonds-made S-301 Steel — developed especially for cutting paper — combines maximum hardness with toughness to give you more cuts per grind. Face-side taper, concave ground for added clearance, plus Simonds famous "mirror finish," provide a keener edge that cuts free, fast and straight. There's longer life in a Simonds Knife!

-with SIMONDS

Circular Cutters

They Run True and Hold Their Edge!

On thinnest tissue or thickest board, Simonds circular cutters, slitters and perforators cut smooth, easy and true. These "cost cutting cutters" are made of Simonds own special electric-furnace steel — specially heat treated and precision-ground to uniform roundness and thickness. There is no better steel for edge holding. There is no better value for your cutter money.

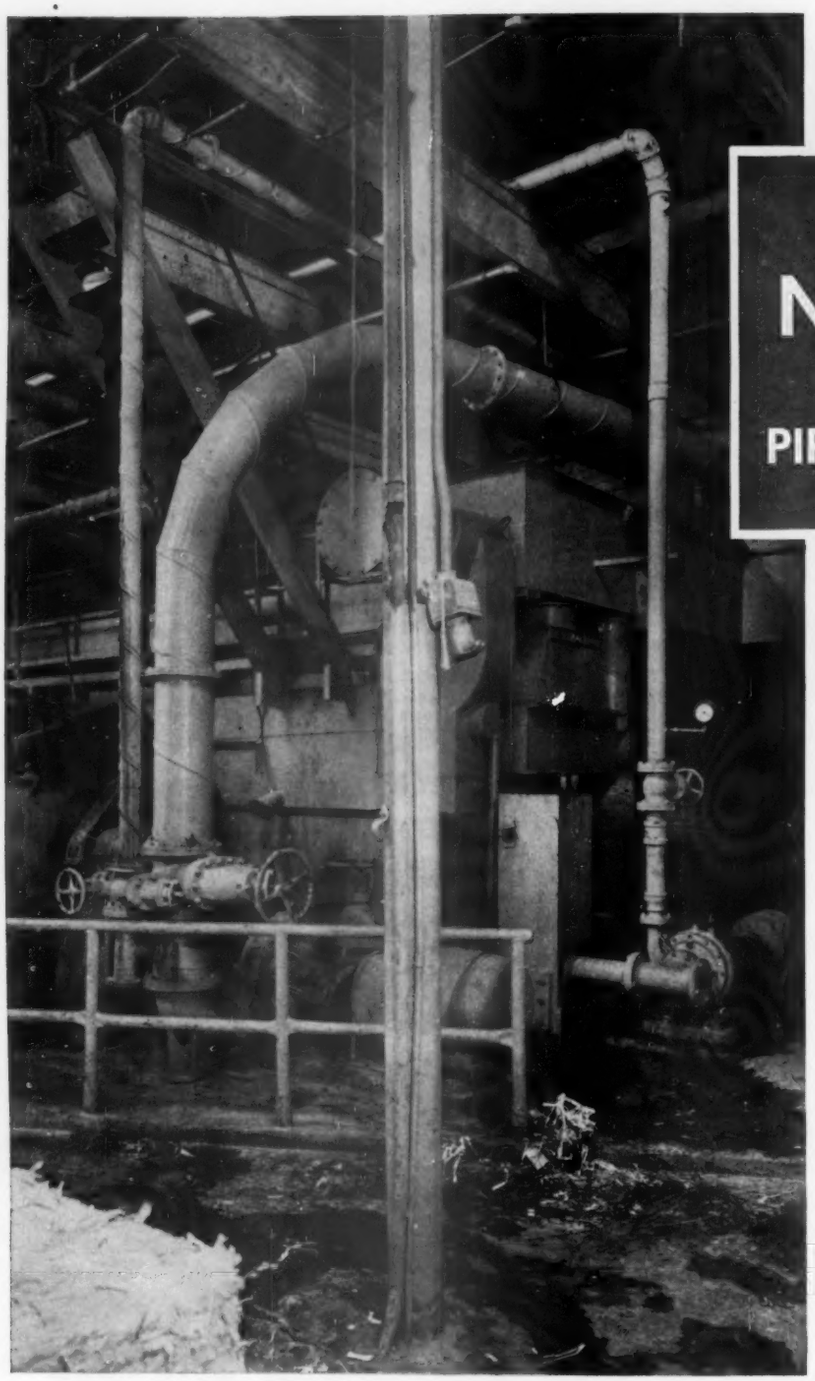
For Fast Service from Complete Stocks

Call your **SIMONDS Industrial Supply DISTRIBUTOR**

SIMONDS SAW AND STEEL CO.

FITCHBURG, MASS.

Factory Branches in Boston, Chicago, Shreveport, La., San Francisco and Portland, Oregon, Canadian Factory in Montreal, Que., Simonds Divisions: Simonds Steel Mill, Lockport, N. Y., Heller Tool Co., Newcomerstown, Ohio, Simonds Abrasive Co., Phila., Pa., and Arvida, Que., Canada



Specify NAYLOR FOR YOUR PIPING LAYOUT

Pipe and fittings fabricated from carbon steel, alloys or stainless steel to meet your most exacting requirements.

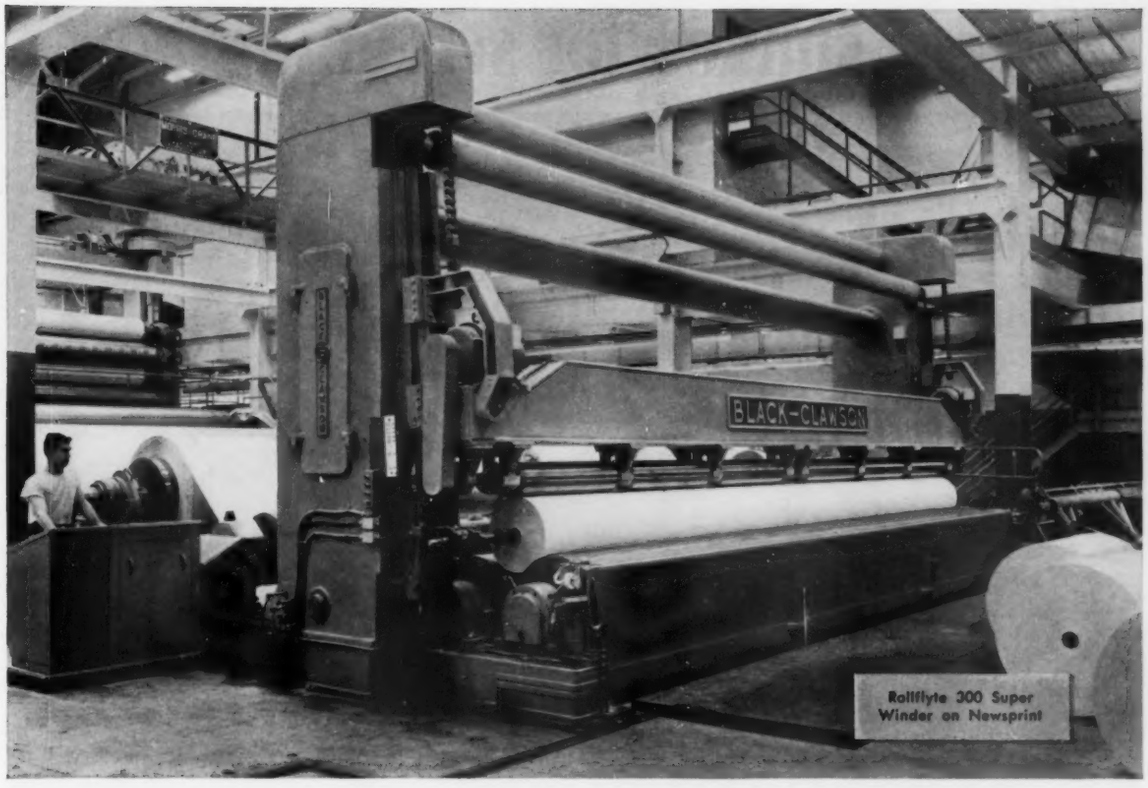
* **PIPE SIZES** . . . from 4" to 30", in wall thickness from 14 to 8 gauge
* **SPECIAL FABRICATIONS** . . . from 3" to 44", in wall thickness up to 3/8"
* **STANDARD FITTINGS** . . . available from stock.

Write for Bulletin No. 59 and send specifications for quotation.

NAYLOR PIPE *Company*

1271 East 92nd Street, Chicago 19, Illinois

Eastern U. S. and Foreign Sales Office: 60 East 42nd Street, New York 17, N. Y.



Rollflyte 300 Super Winder on Newsprint

Black-Clawson ROLLFLYTE MILL WINDERS Produce Clean-Cut Rolls of Uniform Density

These design features make Rollflyte Winders more productive, easier to operate and assure quality rolls

1. Properly sized rotating members for minimum deflection
2. Rotating members balanced for speeds in excess of maximum operating speeds
3. Heavy box framing for vibration dampening, rigidity and stability
4. Rugged, compact, clean design
5. Large covered openings for easy service and maintenance
6. Standard, readily available commercial anti-friction bearings
7. Shear or score cut slitters

Available accessories include:

- Roll ejector
- Roll lowering table
- Floor mounted control console
- Air operated rewind shaft
- Rewind shaft core holder
- Rewind shaft puller
- Air operated front slitter support bar
- Constant tension control

Black-Clawson Rollflyte Mill Winders are furnished in rewind capacities from 48" to 84" dia. in trim widths to suit your paper machine. Get the full facts on this complete line of winders. Contact Black-Clawson's Slitter-Winder Sales Dept., Fulton, N. Y. Ask for Bulletin 23-DM.

SLITTER-WINDER SALES DEPT.

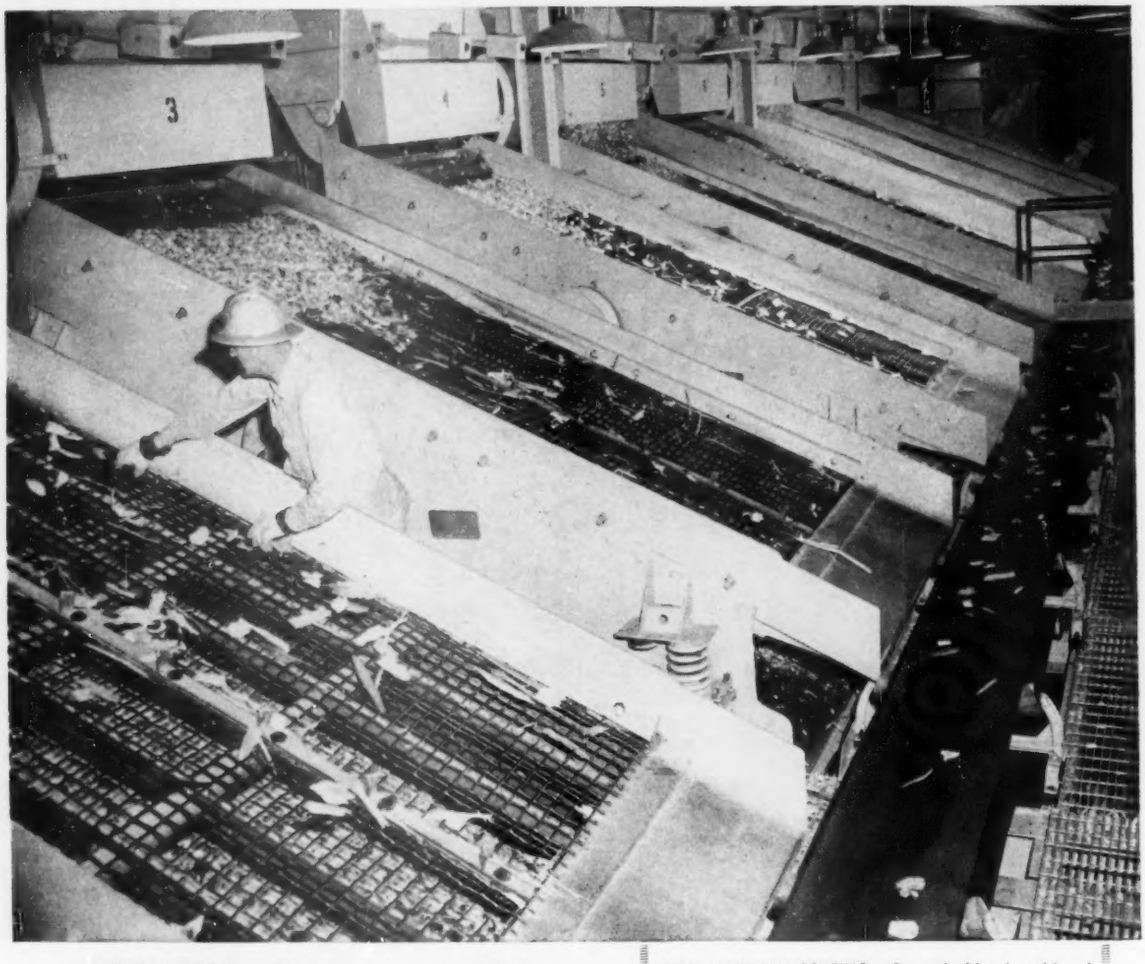
THE BLACK-CLAWSON COMPANY

SLITTER-WINDER SALES DEPT., FULTON, N. Y.

Executive Offices—250 Park Ave., New York, N. Y. • Pandia Division, Pulp Mill Equipment, Hamilton, Ohio • Shartle Division, Stock Preparation Equipment, Middletown, Ohio • Paper Machine Division, Paper and Board Machines, Watertown, N. Y. • Dilts Division, Converting Machinery, Fulton, N. Y. • Black-Clawson (Canada) Ltd., Canadian Sales & Manufacture, Montreal, P.Q. • Black-Clawson International Ltd., British-European Sales and Manufacture, London, England • District Sales Offices, Atlanta, Ga.; Downingtown, Pa.; Portland, Ore.; Appleton, Wis.; Hamilton, Ohio

In Canada: Black-Clawson (Canada) Ltd., 5460 Patricia Ave., Montreal 29

"Great shakes" for screening jobs



LINK-BELT vibrating screens bring speed and economy to sizing, dewatering of chips and bark

WHETHER it's sorting chips or salvaging small wood particles from large volumes of water, Link-Belt has a vibrating screen to do the job . . . and save you money doing it.

Special deck design of Link-Belt liquid screens permits use of a very fine cloth. This—plus high-frequency, small-amplitude vibration—assures maximum solids retention, maximum liquid passage. Link-Belt dry screens perform with a positive, uniform circular motion that provides equal sizing opportunity for every particle . . . fast, sure stratification.

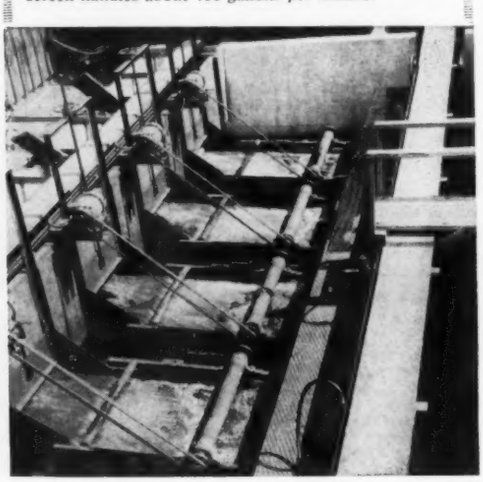
For full details, send for Book 2777. Address Link-Belt Company, Dept. P.P., Prudential Plaza, Chicago 1, Ill.

LINK-BELT

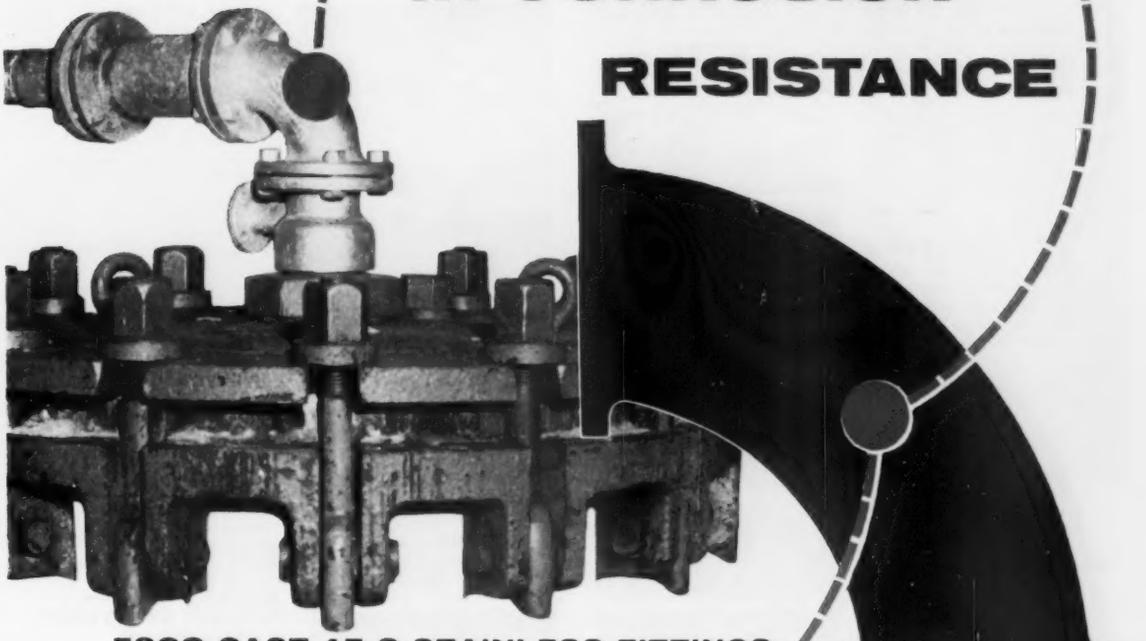
VIBRATING SCREENS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World. 15.045

FAST, ACCURATE SORTING of wood chips is achieved at this mill by a bank of nine Link-Belt CA (Concentric Action) vibrating screens. High-intensity circular motion assures sharp separation of sawdust and oversizes. Below, five Link-Belt liquid vibrating screens separate bark from hydraulic barker wash water. Each screen handles about 400 gallons per minute.



EXTRA RICH IN CORROSION RESISTANCE



ESCO CAST 45-S STAINLESS FITTINGS LAST FAR LONGER ON DIGESTER RELIEF LINES

Sulphur dioxide gas, acid fumes and steam at 280°F. and at 80 pounds pressure add up to a severe corrosion problem on digester relief lines in sulphite pulp mills.

ESCO Alloy 45-S Cast Fittings out-perform wrought type 316 fittings under corrosive conditions because they contain a "richer" balance of chromium and molybdenum, the elements that perform major services in resisting corrosion.

ESCO Cast Fittings and Flanges are available from local warehouse stocks in a complete range of types, sizes and alloys to help solve your corrosion problems.

Call your nearby ESCO representative today for details, or write direct. Ask for ESCO Fittings Catalog 156, and ESCO Alloy Notebook No. 7, "What Is Corrosion?".

ALLOY CASTING INSTITUTE ACI MEMBER

ESCO®

ELECTRIC STEEL FOUNDRY COMPANY

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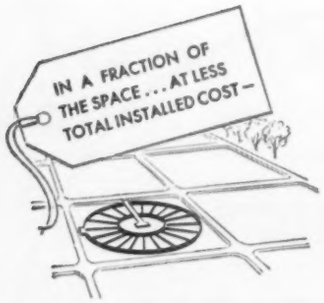
MFG. PLANTS AT PORTLAND, ORE. AND DANVILLE, ILL.
Offices in Most Principal Cities
ESCO INTERNATIONAL, NEW YORK, N. Y.
IN CANADA ESCO LIMITED



you get HIGH performance... *at* LOW cost...*with* INFILCO water treatment equipment

ACCELATOR®
high rate treatment plant
... saves up to 80% of space
Clarifies, or softens and stabilizes water in a *single* basin; replaces slow rate separate mixing, coagulation and sedimentation basins. Produces clearer, more stable effluent; "slurry contact", not "sludge blanket" unit.
Bulletin 1625

FILTERS
Complete equipment for gravity filters, including meters, rate controllers, control panels or operating tables. Design for your particular needs based on years of experience. Pressure filters, too, for plants of smaller capacity.
Request Information

CLARIFIERS
For simple clarification by sedimentation. Type WS for smaller diameters. Type BF for larger diameters. Three different types of surface skimmers available, depending on operating conditions.
Bulletin 6000

ACCELAPAK®
TREATING PLANT
for producing potable water in plants or woodlands
Removes objectionable turbidity, organic matter, iron, taste, odor. Delivers purified and clarified water. Economical to operate.
Bulletin 1870

CYCLATOR®
CLARIFIER
... saves valuable space
... recovers water and fibre
Clarifies white water and mill effluents by chemical and mechanical methods with solids recirculation in a single unit. Combines all functions in a single basin. **Bulletin 850**

SEDIFLOTOR®
Saveall
Where space is limited and high-rate clarification a must, this air flotation unit is ideal for removing both flotable materials and settleable solids.
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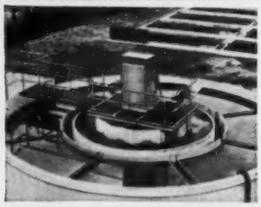

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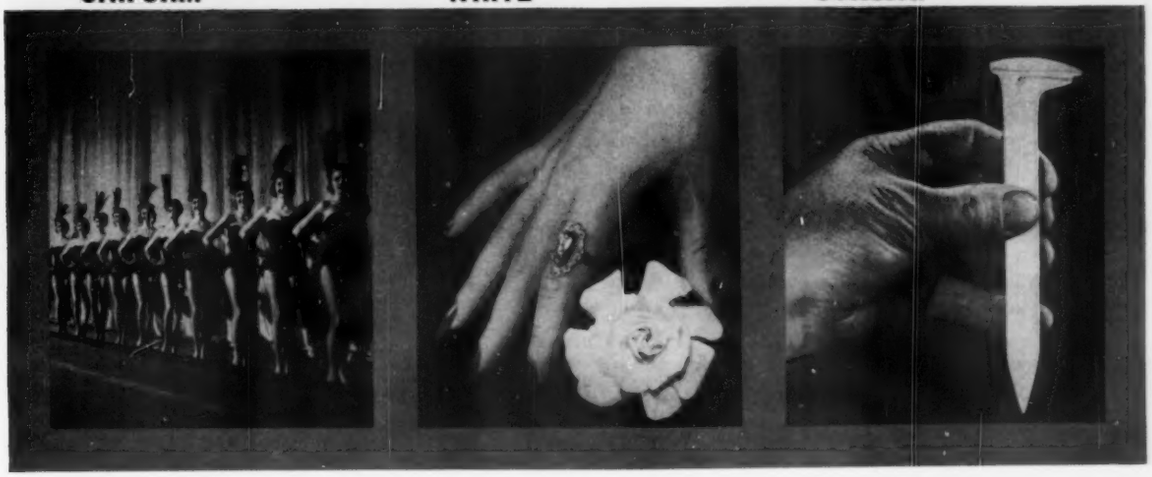

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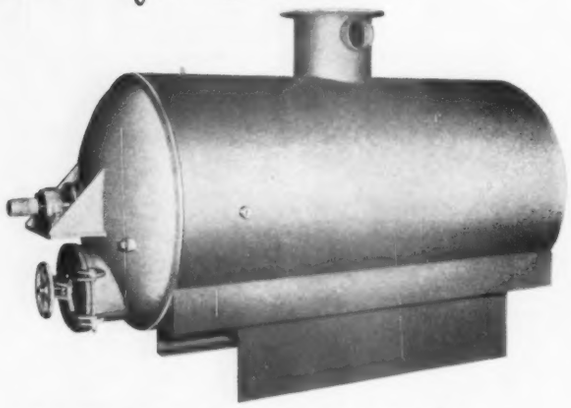

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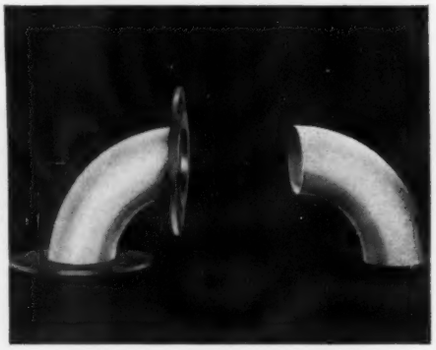

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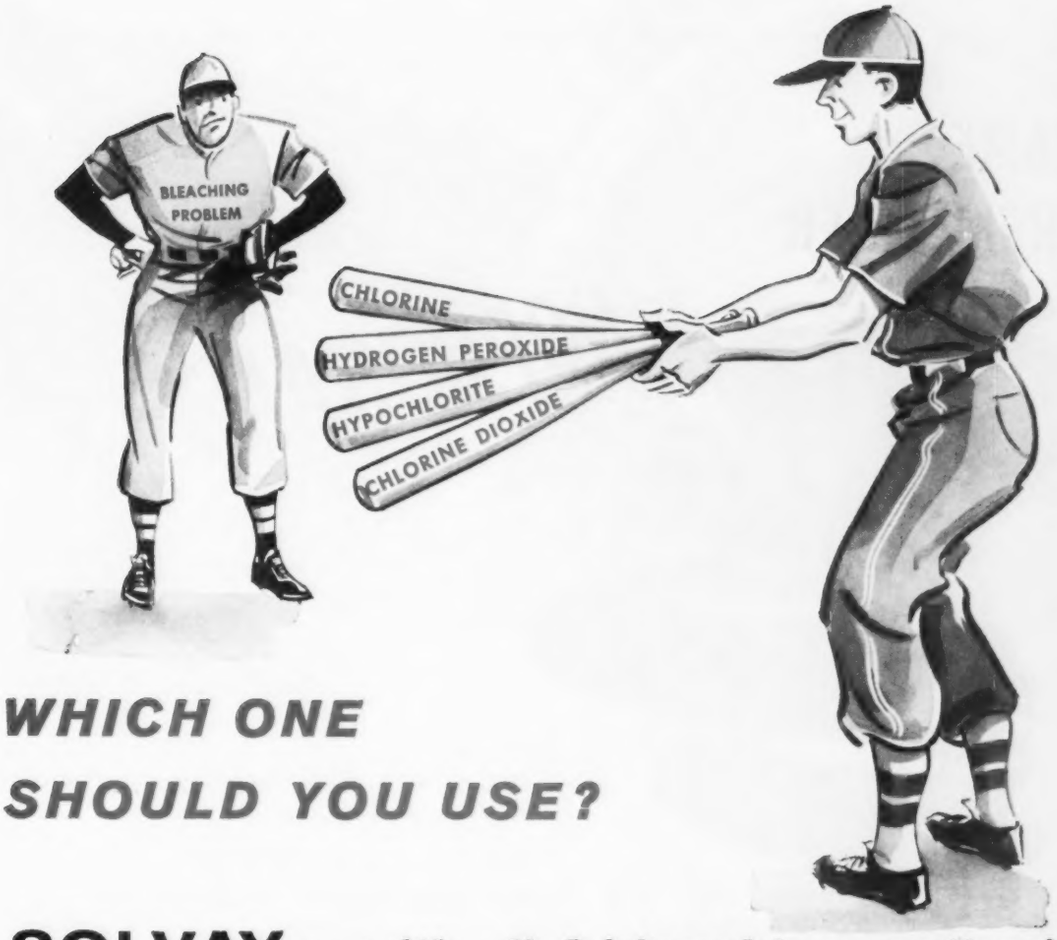

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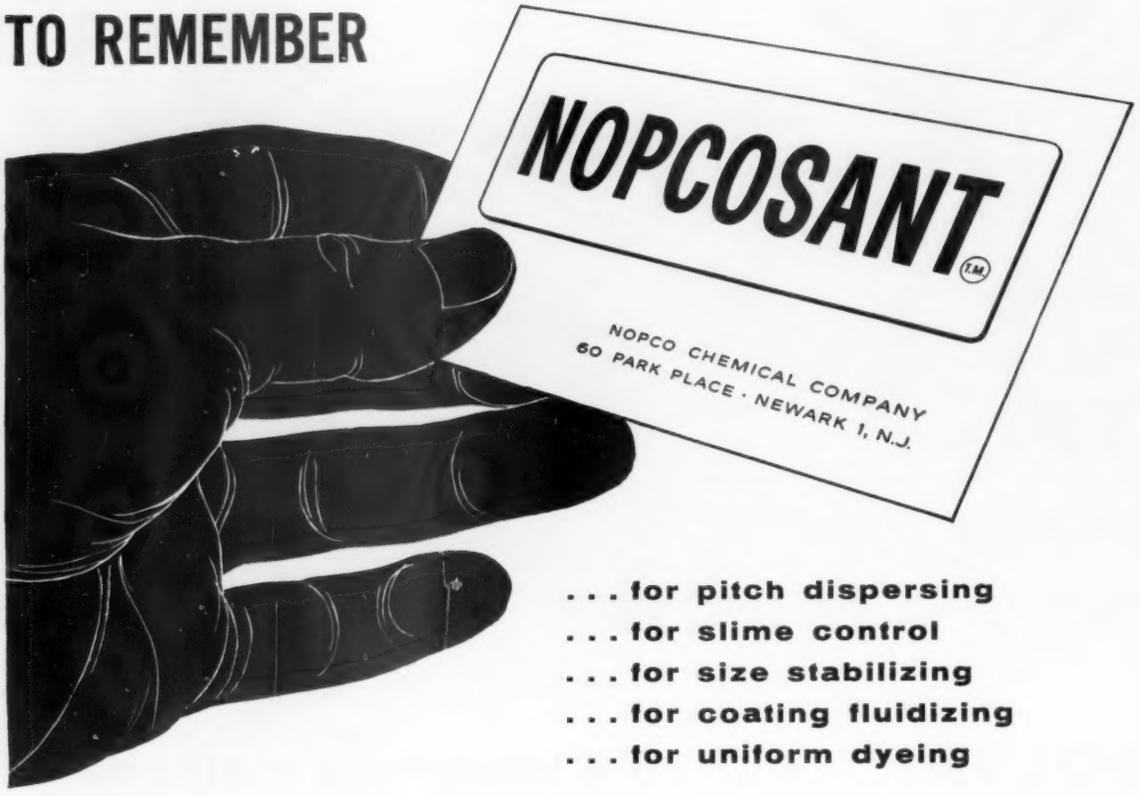

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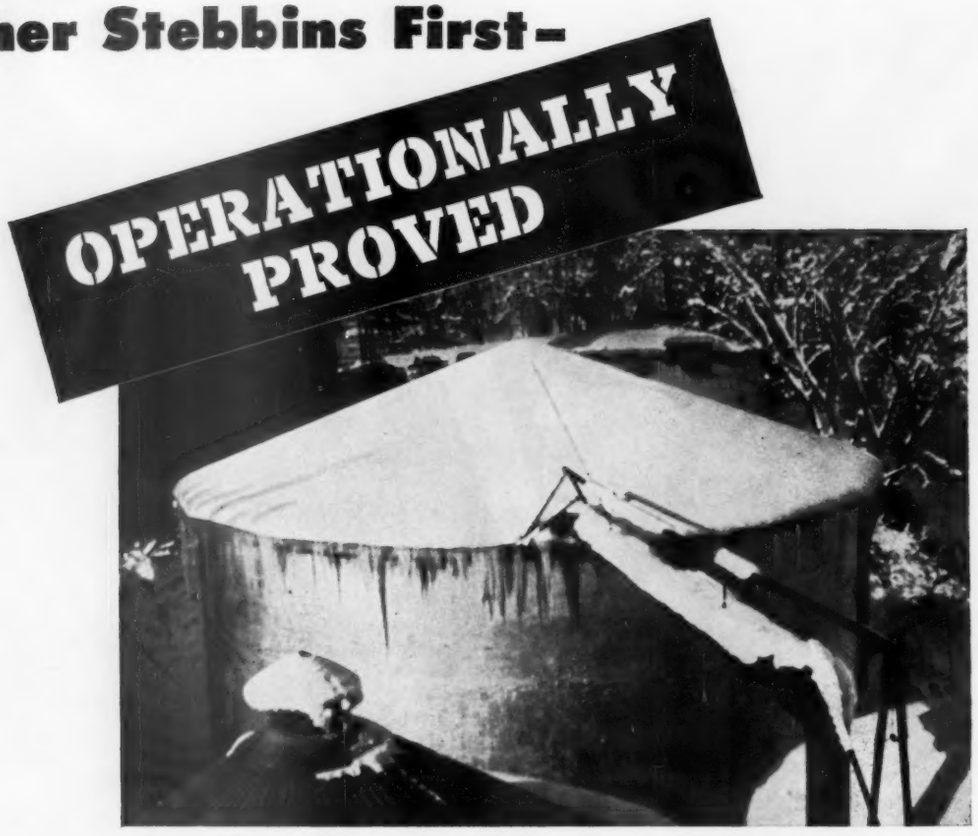

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The tank illustrated, located near the Canadian border, has been through two winters carrying stock at 4% consistency. With no addition of heat, there has been no freezing—no adherence to the inner walls.

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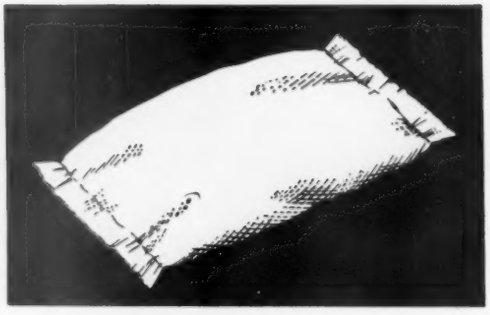

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Special for PULP & PAPER . . . . . The Future of Lignin

New Horizons for Lignin

. . . appear as a result of the work of two scientists who may have opened the way to solving the riddle of lignin structure.

By Dr. J. S. BARTON
Director, Packaging Research & Development
Western Waxide Division
Crown Zellerbach Corp.
San Leandro, Cal.

Dr. Barton has written this article especially for PULP & PAPER readers, with permission of *Scientific American*. Dr. Barton was a leader in important basic research fields for Crown Zellerbach at its Central Research Laboratories in Camas, Wash., U.S.A., before becoming head of its packaging research activities.

This article includes his own observations on the significance of the lignin report.

He visualizes lignin depolymerizing plants operating analagous to enzyme conversion of starches. A lignin-based chemical industry "will then have become a reality," he predicts.

DR. J. S. BARTON

• The riddle of the structure of lignin continues to be one of the major unsolved problems in the field of organic chemistry. Although 100 years have passed since it was first recognized that wood consists of cellulose surrounded by an "encrusting material" (later called lignin), only slow progress has been made unravelling the structure of this material, and even today our information can best be called fragmentary.

The use of classical chemical reactions to isolate and depolymerize lignin to useful materials has yet to yield anything of outstanding commercial importance. Inasmuch as 20,000,000 tons of lignin were either burned or sluiced into streams last year, this represents a source of useful organic compounds of exciting potential.

The Ultimate Answer

An article appearing in the October 1958 issue of *Scientific American* concerned recent experiments on synthetic and degradative processes for lignin. In the article F. F. Nord and Walter J. Schubert opened a new approach to this fascinating subject. In fact, it appears that an attack such as this, using selective enzymatic processes, will probably be the ultimate answer to this problem.

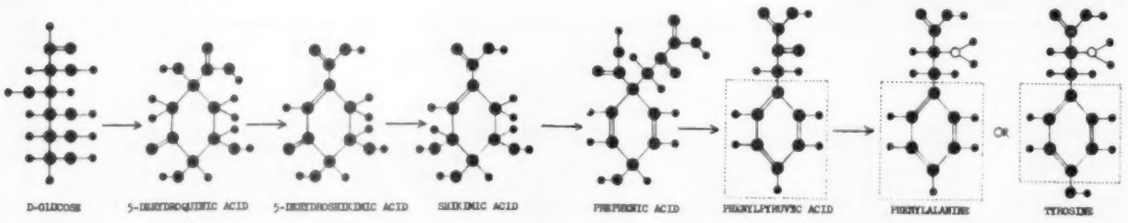
Dr. Nord and his co-workers have been interested in how plants synthesize lignin, reasoning that if a better understanding were had of this process, a more realistic approach could be taken to the depolymerizing or degradation steps to useful monomeric chemicals. They have questioned the method in which plants synthesize the aromatic benzene ring around which lignin is built. The first product of photosynthesis are chains of carbon atoms—the glucose monomers. They may be looped into rings by processes that are reasonably well understood, but we do not know the next steps in the process that converts these cyclic compounds into aromatics. Laboratory processes that accomplish this are difficult and inefficient. Plants, however, synthesize aromatics (principally lignin) by the ton as part of their normal metabolism.

The authors describe a unique experiment that may prove to be a milestone in unravelling the structure of lignin:

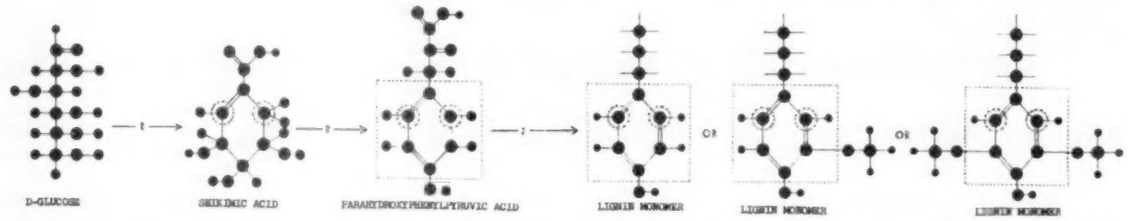
"The first real clue to how plants synthesize lignin arose from the studies of the proteins. Several of the amino-acid protein monomers contain benzene rings. Investigators recently turned up two mutant strains of bacteria that can synthesize two of these aromatic amino acids (phenylalanine and tyrosine) from glucose. Bernard D. Davis, now at Harvard University, traced some steps of the synthesis. The organisms first convert the linear molecule of glucose into a cyclic (but not aromatic) compound and then, via several transformations, into the aromatic compound phenylpyruvic acid. This substance seems to be the immediate precursor of the amino acids.

Similar to Amino Acids

"Now these amino acids resemble the lignin monomers in having a chain of three carbon atoms attached to a benzene ring. It seemed likely to us that the process by which plants syn-



SYNTHESIS OF AROMATIC COMPOUNDS by bacteria occurs in a series of steps, some of which are shown here. The linear molecule of glucose (the fundamental product of photosynthesis) is first converted to a cyclic compound and then, through several intermediate substances, into the aromatic compound phenylpyruvic acid. This substance is thought to be the precursor of the aromatic amino acids phenylalanine and tyrosine, two of the 20-odd molecular units that make up the long-chain molecules of proteins.



SYNTHESIS OF LIGNIN MONOMERS by plants resembles the bacterial synthesis, but many more steps remain to be worked out. Broken circles show the atoms of radioactive carbon that trace the conversion of intermediate compounds into lignin with no rearrangement of the six "ring" carbon atoms. The vanillyl type of lignin monomer (second from right) seems to occur in all kinds of lignin; the other two types are found in varying quantities in lignins from different plant species.

thesize lignin might resemble the bacterial synthesis of the aromatic amino acids. Accordingly, we labeled some samples of shikimic acid (an intermediate compound in the bacterial synthesis) with the radioactive isotope carbon 14. Shikimic acid is not aromatic, but it does contain a ring of six carbon atoms; we labeled two of them.

"We force-fed the labeled acid via the leaves to sugar cane plants. After several days of this feeding we cut down the plants, extracted the lignin and converted it into vanillin. Not only did we find the vanillin radioactive, but we also determined that the labeled carbon atoms occupied precisely the two positions in the vanillin molecule that correspond to the positions labeled in the shikimic acid. Clearly the sugar cane had converted the non-aromatic ring of shikimic acid into the aromatic ring of lignin.

"By similar experiments we were able to identify another compound involved in the lignin synthesis-parahydroxyphenylpyruvic acid. This formidably-named aromatic substance may be the immediate precursor of the lignin monomers. At any rate, it is closer to them than is the non-aromatic shikimic acid. The other steps in the synthesis remain to be mapped out.

The Final Secret

"A final answer to the question of how plants make lignin will not be given until we know the complete structure of lignin. We can obtain the original pure lignin polymer, and we know that it consists of two or more different monomers, but we still do not know the precise structure of these monomers. So tightly are they bound together in the lignin molecule that we cannot tear them apart without damaging them. But here too enzymes may succeed where more violent chemical methods fail. Some microorganism may be able to break lignin into its component monomers as delicately and precisely as the brown rot fungi can separate it from cellulose. The discovery of an enzyme that can depolymerize lignin would bring us still closer to unlocking the final secret of this mysterious and potentially valuable substance."

It would appear that the real message of this article is contained in the last sentence of the preceding paragraph. Since classical chemical methods have been relatively unrewarding, it would seem that a biological attack should command immediate attention by investigators everywhere interested in this field. The problem then becomes one of studying mutations of bacteria and fungi that will secrete the enzyme that will selectively depolymerize lignin as quantitatively as possible. If this approach is successful, we might visualize lignin depolymerizing plants operating analogous to the enzyme conversion of starches to useful dextrin and sugars. The lignin-based chemical industry will then have become a reality.

Microscopy Course Will Be Given at Appleton

The 15th Fiber Microscopy Course for industry representatives will be conducted at The Institute of Paper Chemistry in Appleton, Wis., Apr. 6 through Apr. 17 under direction of Dr. I. H. Isenberg, staff wood technologist.

The course is a practical study of the microscope, fiber analysis, the use of reagents and stains in fiber identification and evaluation, and the application of microtechniques to pulp and paper research. Enrollment is limited to 30 students. Inquiries may be addressed to George D. Jernegan, director of continuing education at the Institute.

New Future Capacities

APPA, NPA and U.S. Pulp Producers issue new figures which show combined paper and paperboard capacities for U.S.A. mills will be increased 1.2 million tons this year and 2.6 million by the end of 1961. North American woodpulp capacity is increasing only 729,000 tons in 1959 and 1960, of which 564,000 is in U.S.A., only 165,000 in Canada. All U.S.A. pulp comes this year —none in 1960.

Survey of U.S.A. Paper and Paperboard Capacity by Types 1958-1961

In thousands of short tons—Maximum or all-out basis, deducting only for annual repairs and restrictions on workdays under union agreements or other regulations

ITEM	TOTAL PAPER AND BOARD	TOTAL PAPER	TOTAL PAPER-BOARD	BUILDING PAPER & BOARD AND WET MACHINE BOARD TOTAL
1958				
New Machines	1,624	751	605	268
Improvements	411	214	194	3
Capacity End of 1958	39,386	16,150	18,842	4,394
1959				
New Machines	761	470	218	73
Improvements	539	263	273	3
Capacity End of 1959	40,686	16,883	19,333	4,470
1960				
New Machines	448	118	330	—
Improvements	368	125	242	1
Capacity End of 1960	41,502	17,126	19,905	4,471
1961				
New Machines	599	74	525	—
Improvements	126	24	102	—
Capacity End of 1961	42,227	17,224	20,532	4,471
DAYS	337	340	338	319

Survey of U.S.A. Paper and Paperboard Capacity by Types 1958-1961

In thousands of short tons—History basis—310 days operation annually for paper; 313 for paperboard

ITEM	TOTAL PAPER AND BOARD	PAPER						PAPERBOARD			BUILDING PAPER & BOARD, WET MACHINE BOARD TOTAL
		TOTAL	Newsprint	Printing Papers	Fine Papers	Coarse & Special Industrial Papers	Tissue	TOTAL	Container-Board	Boxboard	
1958											
New Machines	1,517	692	308	93	42	171	78	558	220	338	267
Improvements	387	207	—1	35	48	77	48	177	134	43	3
Capacity End of 1958	36,749	15,002	2,307	4,450	1,695	4,540	2,010	17,464	9,433	8,031	4,283
Daily Capacity End of 1958	117.12	47.56	6.61	14.35	5.47	14.65	6.48	55.80	30.14	25.66	13.76
1959											
New Machines	709	439	108	122	44	113	52	197	107	90	73
Improvements	489	236	70	45	41	66	14	250	117	133	3
Capacity End of 1959	37,947	15,677	2,485	4,617	1,780	4,719	2,076	17,911	9,657	8,254	4,359
Daily Capacity End of 1959	120.92	49.68	7.13	14.89	5.74	15.22	6.70	57.23	30.85	26.38	14.01
1960											
New Machines	400	104	—	47	—	50	7	296	156	140	—
Improvements	339	114	5	30	30	33	16	224	60	164	1
Capacity End of 1960	38,686	15,895	2,490	4,694	1,810	4,802	2,099	18,431	9,873	8,558	4,360
Daily Capacity End of 1960	123.29	50.39	7.15	15.14	5.84	15.49	6.77	58.89	31.54	27.35	14.01
1961											
New Machines	538	68	—	—	35	33	—	470	361	109	—
Improvements	120	24	—	16	31	—29	6	96	56	40	—
Capacity End of 1961	39,344	15,987	2,490	4,710	1,876	4,806	2,105	18,997	10,290	8,707	4,360
Daily Capacity End of 1961	125.39	50.68	7.15	15.19	6.05	15.50	6.79	60.70	32.87	27.83	14.01

Survey of Woodpulp Capacity by Types 1958-1960

In thousands of short tons—As of Dec. 31 each year

CAPACITY END OF YEAR	TOTAL	—SULFITE, PAPER GRADES—				—SULFATE, PAPER GRADES—					—GROUNDWOOD—				
		Dissolving & Special Alpha	Total	Bleached	Unbl.	Total	Bleached	Semi-Bl.	Unbl.	Soda & Semi-Chemi.	Total	Bleached	Unbl.	Defibrated & Exploded	Screenings
UNITED STATES															
1958	28,282	1,300	3,012	2,476	536	15,124	5,151	641	9,332	2,821	4,249	672	3,377	1,710	66
1959	28,846	1,420	3,012	2,476	536	15,473	5,343	641	9,489	2,872	4,293	716	3,577	1,710	66
1960	28,846	1,420	3,012	2,476	536	15,473	5,343	641	9,489	2,872	4,293	716	3,577	1,710	66
CANADA															
1958	13,123	525	2,674	692	1,982	2,350	1,286	96	968	310	7,054	85	6,969	110	100
1959	13,126	525	2,674	692	1,982	2,330	1,286	96	968	310	7,054	85	6,969	110	103
1960	13,288	525	2,766	777	1,989	2,395	1,286	119	990	335	7,054	85	6,969	110	103
NORTH AMERICA															
1958	41,405	1,825	5,686	3,168	2,518	17,474	6,437	737	10,300	3,131	11,303	757	10,546	1,820	166
1959	41,972	1,945	5,686	3,168	2,518	17,823	6,629	737	10,457	3,182	11,347	801	10,546	1,820	169
1960	42,134	1,945	5,778	3,253	2,525	17,868	6,629	760	10,479	3,207	11,347	801	10,546	1,820	169

SPECIAL REPORT FROM MEXICO

Mexican Industry Grows

Controversies arise over "national pulp." Chihuahua mill may make paper. Other companies are carrying on expansion.

By ALBERT W. WILSON
Editor, PULP & PAPER

—Mexico City

● A thriving, rapidly expanding Mexican paper industry—second biggest to Brazil's in Latin America—is largely concentrated within 50 miles of this "last world capital to say goodnight to the sun." That description of Mexico City—world's seventh largest city—I heard in an interview with peppery, world-traveled José de la Macorra, head of this country's biggest paper company. He pointed out that no other nation's capital lies between here and the international dateline to the west.

A great many changes have taken place in this city of 4,000,000 and nation of 32,500,000 since the writer last toured most of Mexico's pulp and paper mills 11 years ago. Today there are a dozen more mills—33 alltogether. And that doesn't count one of the great curiosities of this sun-blessed land—an additional 250 little mills which are not listed in any directories, but make sun-dried crude paperboard for roofing mostly, also shoe boxes and book backs (see picture).

In addition, there is a centuries-old tribal custom in remote villages of making paper by hand for religious or ceremonial purposes. Mulberry or other bark or fiber is cooked, beaten and dried into paper, exactly as it was done thousands of years ago by Aztecs and Mayans, as long ago, perhaps, as early Chinese papermaking. Hans Lenz, who, besides heading a major Mexican paper company, has written a book on this subject, showed the writer a thrilling new color movie of this practice in a Puebla mountain town. It took days for a native woman to make small sheets of the paper, strictly following a set ritual, then a witchdoctor cut the sheets up into figures of gods or spirits, placed them in a framework of sticks over a prostrate sick man, then cut a rooster's neck and dripped its blood over the paper, and finally burned up the frame and paper—this was supposed to cure the patient.

"National Pulp" a Hot Issue

Getting back to Mexico's modern paper industry, there have been other important changes since my last visit 11 years ago. "National pulp" has become a byword—and a hotly debated issue. This is the result of the government's vigorous policy of protecting home industries of all kinds, in this case requiring purchases of Mexican market pulps to match the amount of imports.

Another noticeable change is that mills are no longer satisfied to buy secondhand machines; often that was all they could afford. Now they want new, up-to-date equipment and are going to Britain, West Germany, Sweden, Italy and the U.S.A. for it. A German industrial exhibition, held here recently, greatly stimulated this trend.

Per capita paper consumption in Mexico is 28 lbs. per person (just three pounds less than in Russia). You sense everywhere here the powerful thrusts of a dedicated leadership pushing ahead the nation's economy and literacy. In this respect, you may draw comparisons with Russia.

I am sure very few cities of the world publish as many different newspapers and magazines as Mexico. There are about 25 self-service stores or "supermarkets" in Mexico City and this requires more paper, as everything they sell must be packaged. In recent years, Sears and Woolworth's, both from the U.S.A., opened big stores here.

Chihuahua May Make Paper

Mexican paper production increased 30% in the short period from 1955 to 1957 (to 357,000 tons annually). This will be increased as several additional machines are starting up, or are expected to be ordered.

The "national pulp" mill, Chihuahua, is shopping for a paper machine. Until now it has made only market sulfate pulp. This may take some of the pressure off paper mills to buy "national pulp." Furthermore, at least two other paper mill executives said they will consider further expansion themselves, in both pulp and paper, if Chihuahua makes paper.

Mexico's population is increasing by 3% each year. But more important, the gross national product is increasing twice as fast—by 6% annually. Business is good, which is good for pulp and paper. Business observers feel prosperity will continue, and this will sustain the peso.

A "Peaceful Revolution"

There have been many improvements in Mexico City. New and wide streets have been built. The number of automobiles has certainly more than doubled in 11 years. Everywhere new buildings are going up. Residential areas as attractive as any in the world have been created upon huge wastelands of lava or in former wildernesses. Mexico's street beggars have all but disappeared. The filthy old markets have been cleaned up, moved out of the gutters and into clean, spacious buildings, and they are using wrapping paper. It is no wonder Mexico City's Mayor Ernesto Perez Uruchurto has been reelected to another 6-year term.

The peaceful revolution in Mexico today is being accomplished by one of the world's proudest races, tracing its origins back to regal Aztec and Toltec civilizations. Mexicans have become more mellow and tolerant of foreigners and "Gringo" (their name for a North American) is no longer a dirty word. The hatred of Spaniards is all but forgotten.

Most business men will tell you that government officials on the whole are dedicated and honest. It is a far cry from the days of Pancho Villa. This dedication sometimes makes things a bit difficult for industries, as in the re-

quired purchases of "national" pulp, regardless of what a mill may actually need.

"National" vs. Imported Pulp

There are many sides to the controversey over "national" versus "imported" pulp. It would be foolish to say one was all "black" and the other all "white." One thing is sure, machine clothing manufacturers—wire and felt companies—and makers of pumps, motors, etc., will be assured quick and effective government protection if they build here. One Swedish-American felt combine knows this and is moving in.

One rough edge of the government edict requiring buying of "national" pulp to equal imports is that price doesn't matter. Another sore spot is that some mills make pulp for their own use—are fighting to have this recognized as "national" pulp, too. They may have to sell their own pulp in order to be able to buy needed sulfite imports. Some mills only use waste paper and they also are required to buy "national" virgin pulp, even though they don't want it. No doubt, many of these issues will be ironed out or compromised. But it may be a long struggle.

Water Problems

Another serious problem exists in the vicinity of this capital, where about two-thirds of Mexico's paper mills are located. The ground has been settling, even cave-ins have occured, because the water level underground is lowering. The government has slapped on a new tax on water extracted from wells, a blow to the paper mills. Because of the conditions, future mills may be built far away from here.

Expanding Companies

The writer toured a dozen mills within 50 miles of Mexico City. Nearly all are making improvements. One is the new San Cristobal mill, in which Scott Paper Co. of U.S.A. and Dr. Dante Sandro Cusi, inventor of a new bagasse pulping process are partners. This is a large and impressive establishment. It has a new Beloit Iron Works Yankee Fourdrinier making Scott grades of tissue, and an older machine from Italy.

Mexico's biggest paper company, San Rafael y Anexas S.A., is completing its first major expansion in a decade, with most new equipment from Germany. This includes a Dörries 136 in. Fourdrinier Yankee, its 11th machine, to make lightweight papers. Fink screens, Jagenburg winder and cutter, Eck supercalender are new additions. At this company's El Progreso mill, a new Jagenburg brush

DESPITE REVOLUTION, CATHOLICISM IS STILL STRONG . . . in Mexico, a paper company would not think of building a machine room without reserving a location for an altar, as shown in this picture. This is in a small mill. At the big San Rafael mill, where new Dórries machine is to be installed, a beautiful altar is already completed, although only the walls and foundation of machine room are done.

A USE FOR MEXICO'S GLORIOUS SUNSHINE . . . There are 33 pulp and paper mills in Mexico, but this doesn't count about 250 little "mills" which make a crude sun-dried paperboard for roofing, shoe boxes or book backs . . . like the sheets spread out in the field in this picture for drying. This unusual industry is widespread because natives cannot afford regular roofing materials and use this paper substitute, which must be replaced frequently.

coater is going in.

In the south, the Tuxtepec newsprint mill has not yet been able to get into regular production because of lack of power and other problems. National pride and desire for producing Mexico's first newsprint was responsible for premature announcements. A team of Canadian papermakers is being flown there to get it going.

This will come as a surprise to many who know Mexico. The San Rafael and the Lenz companies, who for so many years dominated the Mexican paper industry as the biggest producers, and were bitter rivals, have been brought together by a younger generation. They are now partners in development of virgin timberlands in Guerrero state 400 kilometers south of Mexico, recently turned over to their use by the government. The new issue of "national pulp" probably also brought together these companies, which for so long pursued their seperate ways.

A new combustion Engineering power plant and General Electric turbine and a laboratory, being built, have taken over what used to be the late Don Alberto Lenz's gardens at the Lenz's Loreto mill, and a recent rebuild of No. 1 machine gave it a new Voith dryer, Ross air system and Millspaugh press, to make one-side glazed paper.

Antonio M. Davila, president of Fabricas de Papeles Faciales y Kraft, who made the first facial tissue in Mexico 12 years ago, now has a second machine on facial and other tissues and towel.

Other Expansions

Amable Carriles is making a major addition to his mill, Cartonajes Estrella S.A., with a second 126 in. machine with a new Black-Clawson wet end. A jewelry salesman just ten years ago, he is reputedly making some of the best box board in Mexico on a 74-in. cylinder machine, which has a new Bruderhaus suction press.

Negociacion Papelera Mexicana started up its 110-in. No. 3 Fourdrinier in July, a rebuilt Balgey & Sewall, with new Valley Iron Works headbox and Beloit suction couch.

At Empaque de Carton United S.A., a third modernized machine is being added. In the 12 years since Mitchell Thom, former superintendent at Sydney Roofing & Paper Co., Victoria, B.C., Canada, came here to direct operations, this company has increased production five times, mostly by a variety of small improvements. On one of its present machines, a new Reliance Electric & Engineering electronic drive "paid for itself in one year."

South of the city are mills of two new companies organized by leaders of the Coyoacan mills. One is El Pilar, a Pomilio process bagasse pulp mill which has a new continuous horizontal digester named "Sputnik." Nearby is the new Fabrica de Papel Mexico, S.A., where rebuilt 134-in. Fourdrinier for bond, manifold and bristol specialties has a new Valley inlet and new Syco drives.

Industrial Telaya, in a small Vera Cruz town where many natives have blue eyes, red hair, fair skin and French names, banana stalks are being mixed with cane bagasse to make corrugating for beer companies.

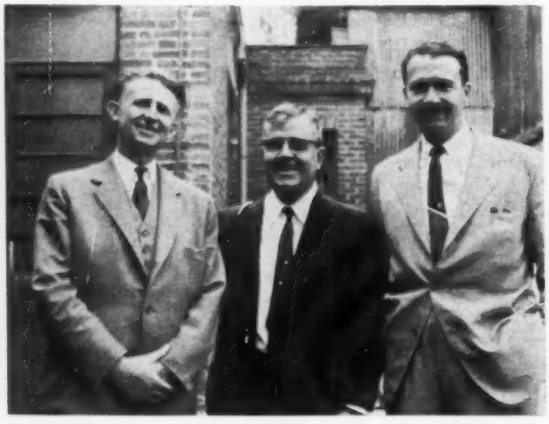
The closed-down Adamos mill, built by the international Italian company of that name, is reported about to reopen. For a while it was thought a United States glassine manufacturer would buy it.

The mills in Monterrey are busy, too. Empaques de Titan is adding another Sandy Hill machine, its third. The Moldanado brothers, paper bag makers, started a Sandy Hill machine last year. The García brothers, lumber family, now have a second paper machine.

Kimberly-Clark Corp.'s "La Aurora" mills has a new 120 in. Beloit wadding and toilet tissue machine in addition to the 100 in. Escher Wyss machine installed several years ago by previous owners. Two other American companies are active in Mexico. Container Corp. of America operates two board machines and a fine paper machine at two locations near Mexico City. Sonoco Products has board mill here.

Waddell Garcia Robles Gomez Rincon Castillo

INDUSTRY MEMBERS IN MEXICO. Here are STUART WADDELL, who represents Kenwood Mills of Canada (felts); CARLOS GARCIA ROBLES, who represents Finnish pulps, Bruderhaus Machine Works of Germany, Harland Drives and Vickery's in England, Ross Engineering, Hurletron, Nichols and Broughton in U.S.A.; RICARDO GOMEZ, founder of El Fenix Paper Mills; DAVID RINCON of Paper Mill Dept., San Cristobal Pulp-Paper Mill; and MANUEL DEL CASTILLO, who represents Svenska Cellulosa, Bolton-Emerson, Cameron, Nash, and other U.S. firms.



Olmedo Wilson Badia

OLMEDO-BADIA FAMILIES ARE WELL LIKED LEADERS. Here are EDUARDO OLMEDO, president of Negociación Papelera Mexicana S.A., and his brother-in-law, JUAN BADIA, general mgr., with ALBERT W. WILSON, editor of PULP & PAPER INTERNATIONAL and PULP & PAPER. The whole family turns out to run departments of the Negociación mill. When her father, the elder Badia, died Mrs. Carmen Badia Olmedo ran the business while raising a family of 10. She is still active, as are several sons and daughters.

THIS MODERN PAPERBOARD PLANT at Santa Clara, Calif. is an example of CCA's up-to-date architecture.

Flexible Stock Preparation

. . . is an outstanding feature of Container Corp. of America's mill at Santa Clara, California

● In a span of six years the Santa Clara operation of Container Corp. of America has become the first integrated plant in the firm's California div. The 52-acre site was acquired in 1953. A folding carton facility went into production the following year, and in 1957 a 150-ton board plant was put into operation.

Long-range plans call for the complete utilization of the entire 52 acres. Currently, the CCA installation spreads over 18; but even with the completion of proposed expansions, the company will be able to construct a planned-for corrugating plant, laboratory and museum. The facility will then be the largest of the firm's West Coast operations.

CCA operates 70 production units at 60 locations in the United States and has manufacturing operations in West Germany, the Netherlands, Venezuela, Colombia and Mexico.

Precision scale models of process equipment were built as a phase of preparatory planning and resulted in muitiple benefits in designing and building the paperboard mill. They served as "trial construction" projects for engineers and architects, facilitated design modifications and improvements and were used as an aid in the training of new personnel.

The new plant, containing 132,000 sq. ft. of operating area, is adjacent to the folding box plant. The new shipping-receiving-storage building actually joins the box plant building and is tributary to both plants. Each has its own office suite—examples of CCA's modern architecture.

When it went into production the board mill had a capacity of 150 tons per day and was primarily devoted to production of 50- and 72-lb. cylinder linerboard (white and colored) and solid fiber chipboards for corrugated or solid-fiber conversion. Production also included specialty high-white news boards and bleached, unbleached and colored chipboards.

The recent installation of additional processing facilities increased capacity to 175-200 tons per day by increasing the number of dryers from 61 to 85, and expanded production to include machine clay-coated board, by installing two coaters on the machine.

Finished paperboard produced here is shipped either as flat stock on skids or pallets, or in roll form.

At the backside of the board plant is a 6-acre storage area for wastepaper, the mill's chief raw material, and baled pulp. A deep well, pumping station, water storage tanks and steam plant also occupy a portion of this area. Storage forms an inverted "L" around the end of the mill building with the "leg" alongside the stock preparation section. Fibrous raw materials are delivered by lift trucks from storage to stock preparation for feeding to process components as needed.

Stock Preparation – Four Furnishes

The stock preparation system at Santa Clara produces and supplies the machine with four different furnishes simultaneously. Three Dilts Hydrapulpers–one 20-ft. diam., two 16-ft. diam.–do the primary processing. The large one, a continuous production component equipped with junker and ragger, operates exclusively on filler material; one of the others on top liner; and the third does basic pulping for both bottom liner and underliner stock.

All stock except filler is discharged from Hydrapulpers to the respective beater chests. Filler stock goes from the pulper to a dump chest, then through three in-parallel Nichols Engineering Vortraps for cleaning and subsequently to three 36- × 136 in. Shartle couch-type thickeners before arriving at the filler beater chest at 3 to 3.5% consistency. An alternate processing route for filler stock is from thickeners (this time at 10-12%) to an American Defibrator 170-ton Asplund wax-asphalt dispersion unit and then to the beater chest at 3.5%.

With specific exception the processing route from beater chests to the machine is practically the same for all four stocks. The flow, for all

except liner stock, is from beater chest to a battery of six Shartle Miami jordans. Top liner stock, however, goes through an Emerson Mfg. Co. Claflin refiner en route to the jordan section for additional refining.

In each case the jordanned pulp next goes to its respective jordan distribution headbox, on to machine chest, machine headbox, then to the screening section (consisting of one Bird slotted-plate rotary screen for each of eight vats) for cleaning prior to reaching mixing tanks immediately ahead of the cylinder vats.

Flexibility is featured throughout the stock preparation section. An example of this is the piping arrangement between headboxes, jordans and Claflin that facilitates their operating either in series or parallel on any of the various furnishes. Pulp from either of the two smaller Hydrapulpers can be pumped to any chest.

The stock preparation section was placed close to the machine to enable the machine operators to observe furnish as it feeds to the vats.

Strategic location of control panels helps facilitate operator observation of production processes at all stages.

The filler Hydrapulper has an individual control panel; controls for the other two pulpers are combined on a single panel setting on the beater room floor between the two tubs. These are Foxboro panels controlling Hydrapulpers, pumps, chest agitators and heat exchangers. The filler-pulping panel also has controls for Vortraps and the thickener drives. Another Foxboro panel controls the Asplund dispersion operations.

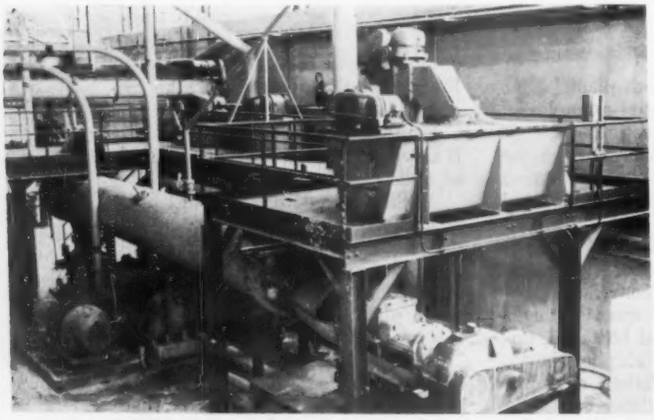
Temperature differential and level recorders for the four machine chests and ammeters for the refiners are incorporated into a panel adjacent to instrument panels controlling the wet end.

Machine instrumentation is concentrated in two Black-Clawson consoles, a Hurletron caliper control system (Electric Eye Equipment Co.) with Esterline-Angus recorders for continuously recording thickness at back, middle and front of sheet, and Foxboro wet and dry end machine instrumentation control panels. Except for one console, these are located opposite the machine wet end adjacent to the stock preparation section.

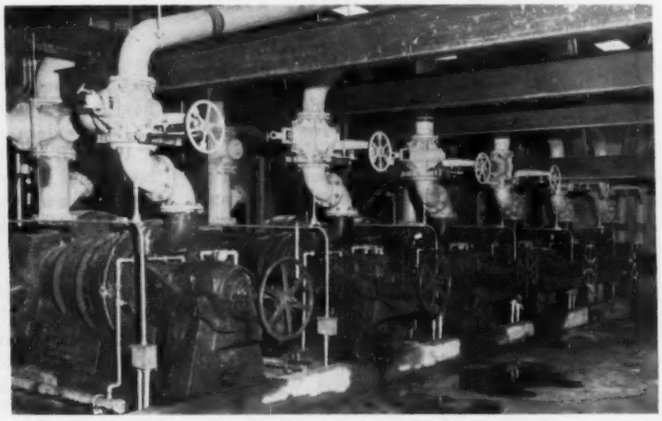
White Water System

The plant was built with realization that water problems will become progressively more acute. White water of each of the four stocks is kept separate and reused by downgrading in pulping operations. Excesses are passed through a 600-gpm Sveen-Pedersen saveall, the resultant reclaimed fiber going to the filler system and the reconditioned water used on felt showers, deckles, vacuum pump seals, etc. This saveall system enables the plant to maintain effluent within the local restrictions while conserving fiber, heat and chemicals.

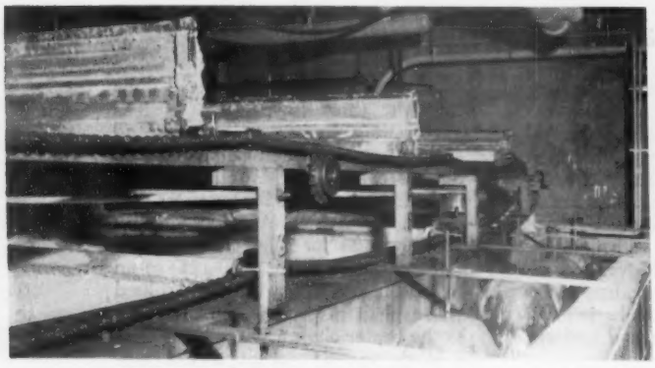
Process water comes from a 715-ft. well. Treatment consists of adding polyphosphates for minimizing scale



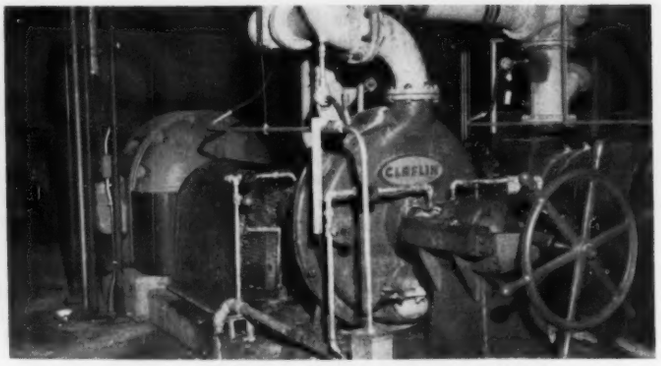
170-TON ASPLUND DISPERSION SYSTEM uses two Davenport presses, horizontal and vertical preheaters, Asplund defibrator and Link-Belt conveyor.



FINAL REFINING FOR ALL FOUR STOCK SYSTEMS is provided by battery of Shartle Miami jordans. De Zurik three-way valves (top) make for flexible flow pattern.



RECOVERING FIBER, filler, chemicals from white water with Sveen-Pedersen saveall facilitates water re-use, contributes to product quality and uniformity.



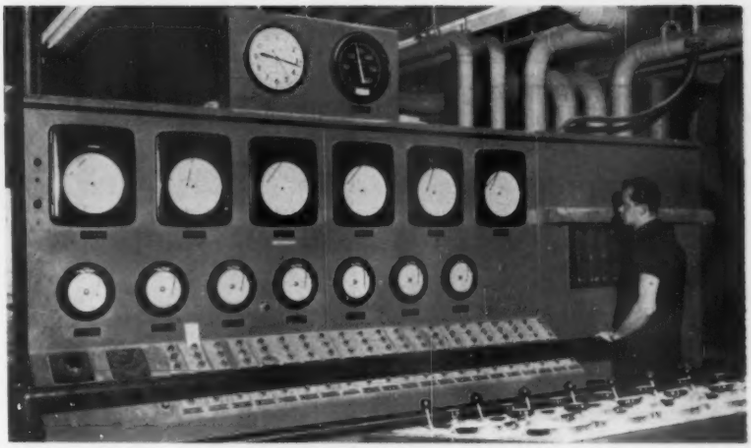
SPECIAL REFINING OF TOP LINER STOCK ahead of jordans with Emerson No. 2 Claflin driven by 450-rpm 250-hp GE motor.

formation in cooling systems. The only other treatment is for boiler feed water. A 100-hp turbine type (Layne-Bowler) deep-well pump setting 180 ft. below the surface (shaft driven from motor at ground level) delivers the water to a 400,000-gal. compartmented tank. It has a 150,000-gal. section for process water and 250,000 gal. capacity for storage and fire protection. Water en route from the 1,500-gpm capacity pump passes through a Krebs cyclonic sand separator en route to storage.

The plant is equipped with a primary Grinnell sprinkler system connecting with the city water supply.

An exterior power plant, erected by OFFCO Construction Co., Long Beach, provides steam for the paperboard mill. It has two 52,000 lb./hr. Union Iron Works boilers, each equipped with five Coen combination gas-oil burners. The boilers have Bailey combustion controls, Bailey three-element feed water controls and Fire-Eye flame supervision by Electronics Corp. of America.

Rated at 250-psi drum pressure at 450°F., the boilers operate at 220-psi, delivering 295°F. 200-psi process steam to the plant. Boiler feed water is treated by a Graver hot-line softening system used in conjunction with Graver hot zeolite softeners.



WET END MACHINE PANEL is scanned by Ted Kargol, beater room foreman. In right foreground is Black-Clawson machine console.

Wet End – Eight-Unit Vat System

Wet end of the 132-in. trim Black-Clawson machine at CCA in Santa Clara has an eight-unit vat system consisting of seven counterflow and one uniflow vats, all wood lined, and suction return drum followed by the primary press and main press sections.

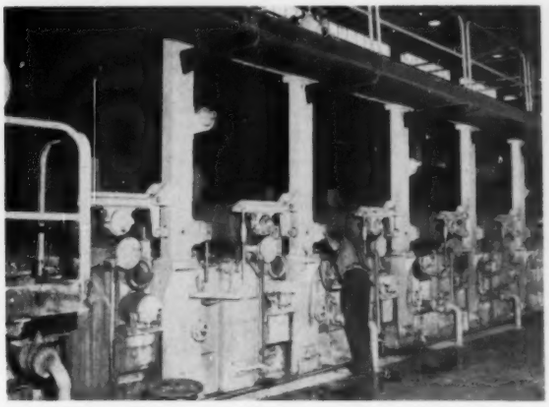
The primary press section has four sets of primaries–1st, 2nd, and 4th are plain, the 3rd a suction primary. A long top-felt returns after the last top primary press roll. The main press section has three plain presses–1st and 3rd are straight-through, 2nd reversing. Top press rolls have pneumatic lifting and loading. Air-operated felt stretchers are used on top, bottom and press felts; guides are air automatic and hand on top and bottom felts, hand on press felts. Primary press rolls, suction drum roll and main press bottom rolls were covered by Stowe-Woodward, some with Stonite the others with rubber.

A broke chest is provided under main press section for handling the sheet from the bottom felt as it passes over the last tail rolls. The sheet, beaten off in the chest by two Shartle agitators, is pumped to the large Hydrapulper to be incorporated into the filler stock.

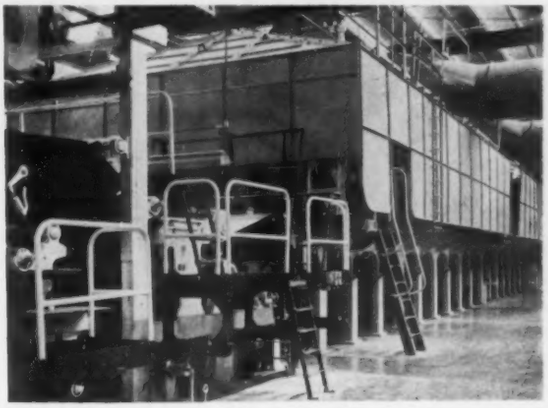
The dryer consists of five individually-driven sections containing a total of eighty-five 48-in. diam. dryers designed for 75-psi steam. Each of the first two groups contains 18 dryers, 13 in the third, 12 in the fourth and 24 in the recently added fifth section. A smoothing press was installed as original equipment between the 2nd and 3rd sections.

Two Black-Clawson Champion type removable clay coaters, operating in conjunction with Champkote coating screens, were added to the dryer in recent months, one between the 1st and 2nd section, the other between the 3rd and 4th immediately following the smoothing press. The dryer section has a Sheahan rope carrier system to carry the sheet around the dryers.

Condensate is removed from dryers via a Ross Midwest Fulton forced vapor circulating dryer system. The machine has a Transite hood and vapor absorption system by Drew Engineering. Drew also provided a blower and conveyor system for transporting cutter-slitter and rewinder

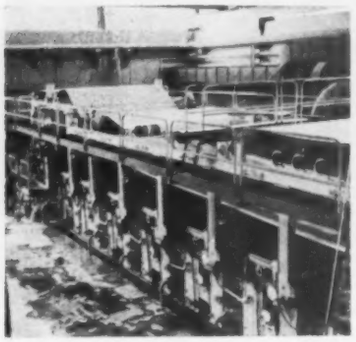


WET END HAS EIGHT VATS with the cylinder couch rolls covered by Stowe-Woodward.

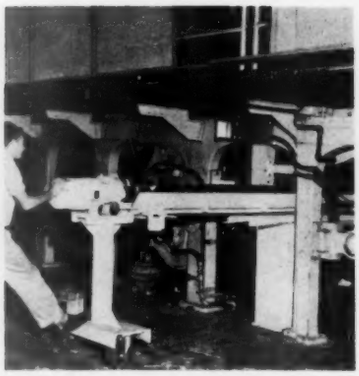


THIRD PRESS SECTION and five-section dryer of B-C machine with Drew moisture absorption system and hood.

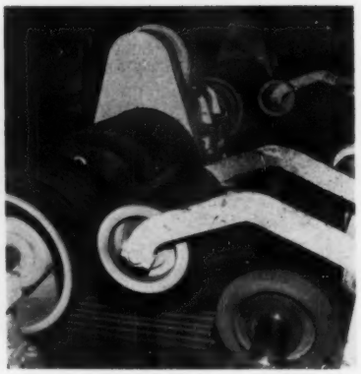
SANTA CLARA



STARTING WET END FOR RUN-IN OF NEW TOP FELT. (Huyck).



ROLLING ONE OF TWO B-C CHAMPION type removable clay coaters between 2nd and 3rd machine section.



ALLIS-CHALMERS VARI-PITCH POWER TAKE-OFFS with Gates Vulco-Rope belts for machine line-shaft.

trim directly into the filler Hydrapulper.

Installation of the coating units extended the mill's products range to include machine clay-coated boards with surfaces suitable for fine-line printing.

The calender section contains two B-C calender stacks—one with seven rolls, the other nine. Following these comes an Autoflyte reel with 36-in. drum capable of handling an 84-in. diam. roll. The reel is so designed that optimum pressure can be maintained on the drum throughout the reeling operation.

The reel has a two-rope carrier system.

A Black-Clawson heavy-duty combination duplex cutter-slitter immediately follows the reel. It handles sheets 20 to 80 in. long, has width-cut assembly with two sets of seven top and bottom slitter blades to facilitate adjusting width settings on one set of blades while the other is operating. Change-over from one set to the other can be made without breaking the sheet.

Next in line is a Model 30 B-C two-drum winder for slitting and rewinding mill rolls. It has 1800 fpm maximum speed, takes 72-in. diam. rolls, has seven shear-cut slitters and is equipped with a 4-in. Tidland collapsible pneumatic rewind shaft and a Thompson hydraulic roll lowering table.

Drives

The machine has a line-shaft drive extending from wet end through to the cutter-slitter and powered by a General Electric turbine developing 400 hp at 200-psi steam pressure. Exhaust steam from this unit is utilized in the dryers. Power is transmitted from the shaft to production components or machine section via Allis-Chalmers Vari-Pitch sheaves. These supply in-drive power to 1st, 2nd and 3rd presses, to each of the dryer sections, smoothing press, calender stacks, reel and cutter-slitter. The Vari-Pitch drives, equipped with Gates short center V-belts, have manual draw adjustment.

Each calender is equipped with electric motor-operated reversing and inching mechanisms. Belt shifters for the two calender drives and the reel drive are equipped with air-operated take-ups for quickly taking up slack between these two components without disturbing draw settings.

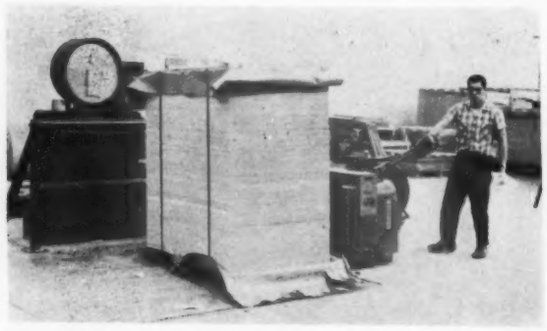
Wet end of the machine has helper drives consisting of electric motors installed on cylinders No. 2, 4, 6, 8; on the suction return drum; the four primary press bottom rolls; on the top roll of 4th primary, and first press top roll.

All machine drives including the smooth-press drive are equipped with Fawick Airflex clutches operated from the front side of the machine. Speed variation is controlled at the wet end control panel by turbine speed control.

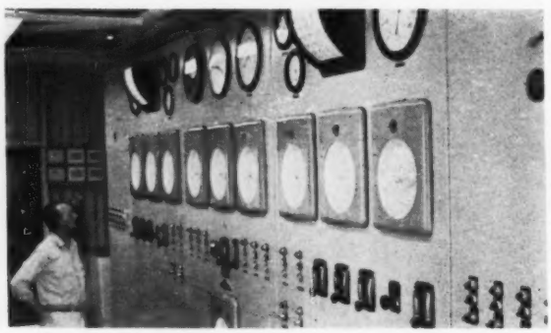
Construction

Construction of the mill, including building and installation of all stock preparative equipment, paper machine and auxiliaries, process piping and instrumentation was by the West Coast construction firm of Swinerton & Walberg Co. and their mechanical affiliate Engineers Ltd. Mechanical Construction Co.

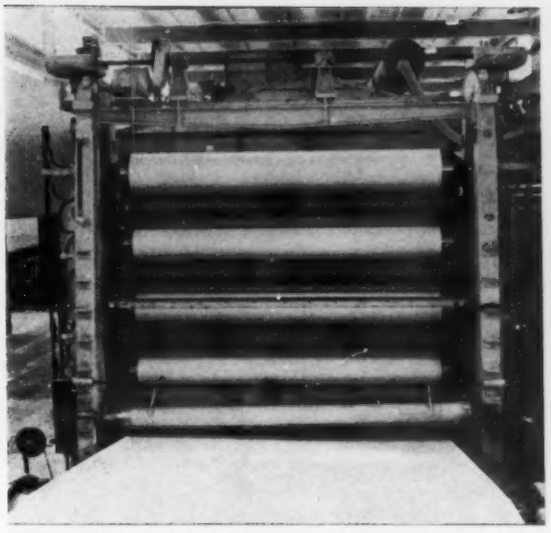
In Dec. 1958, these two firms made



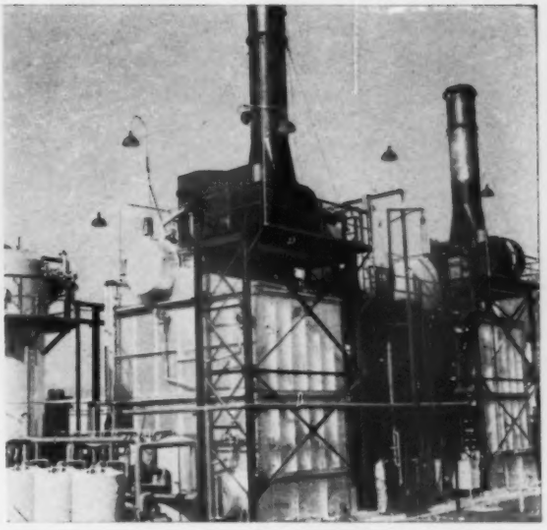
REMOVING SKID LOAD (Acme Steel strapping) from Fairbanks, Morse Printomatic weigher with battery-powered (Exide) Powerox.



BRUCE McCAULEY, steam engineer, checks Bailey power plant control board. Plant has Bailey combustion, feed water controls and Graver feedwater softening.



NINE-ROLL DRY CALENDER STACK (Black-Clawson) with Lodding doctors as viewed from top of slitter-cutter. (Wet calender has seven rolls.)



OPEN POWER PLANT with two 52,000-lb.-per. hr. Union Iron boilers supplies steam. Units equipped with Coen combination gas-oil burners, Fire-Eye flame supervision.

the necvessary changes to the paper machine to increase its capacity by approximately 25 tons per day. This change-over was accomplished within 10 days elapsed time, which established several records.

CCA engineers and Albert C. Martin & Assoc., jointly worked out engineering and architectural features of the building.

The tilt-up concrete structure has steel support columns located on the building exterior, a construction innovation contributing to both form and function. These exposed columns frame the exterior surfaces and make for smooth interior walls. Interior conditions are further enhanced by smooth daylight lighting facilitated by a 7-ft. band of translucent corrugated fiberglass (Owens-Ford's Corolux) extending around the building between roof and wall tops.

Versatility in paperboard production at Container Corp.'s Santa Clara mill enables it to produce board in a wide range of types, weights and colors. Coloring can be incorporated into stock at the beaters and at the seven-roll wet calender stack, which is equipped with water boxes for application of plain water, starch and color to one or both sides of the sheet.

The recent installation of two removable clay coaters extensively expanded the range of products produced. To run stock calling for coating applications, the coaters are quickly rolled into position, secured and hooked up. When the coating runs are completed these components are re-mounted on their caster-equipped support members, removed from the machine and rolled into storage. END

Men Important to CCA Santa Clara Operation

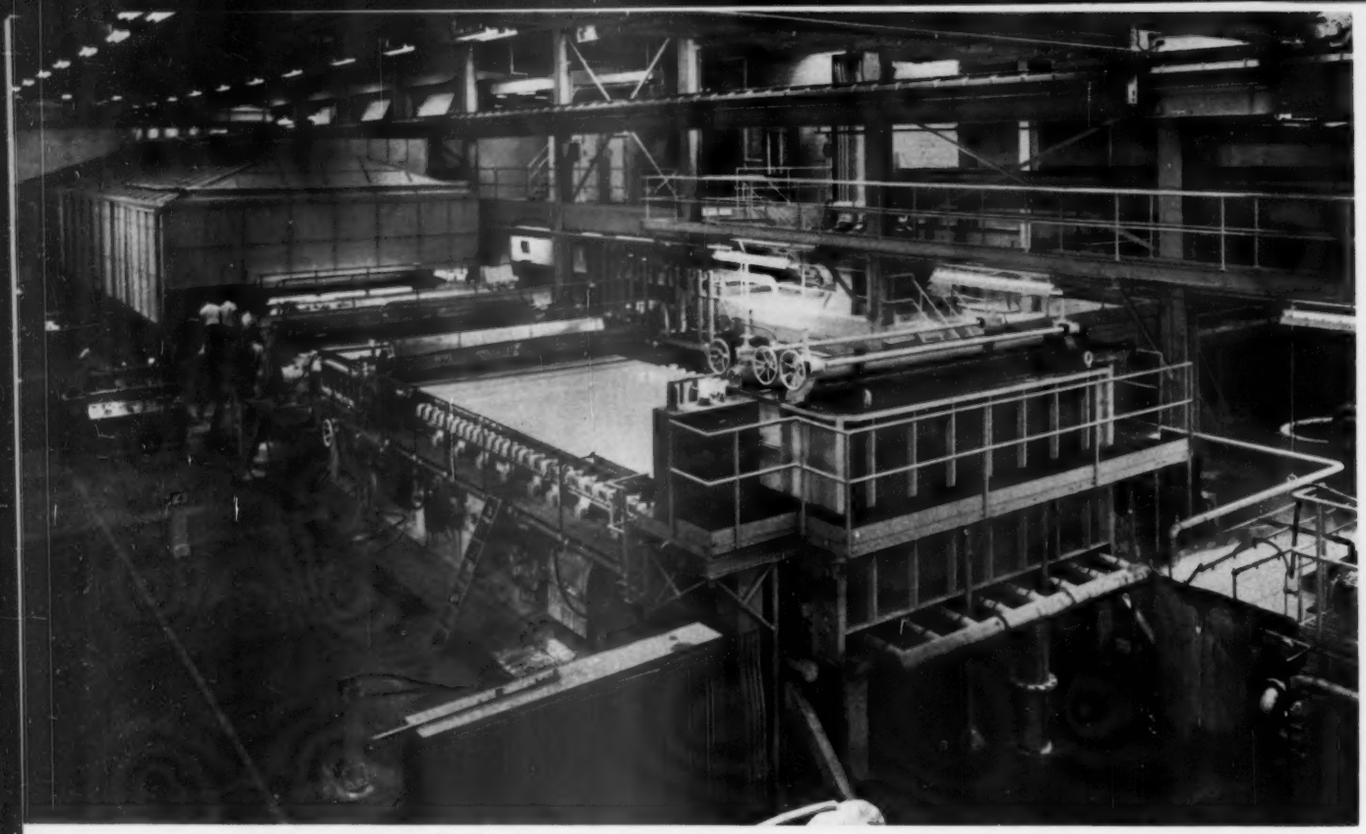
Richards ..... Ritchie ..... Padavic

Reeves ..... Healea ..... Hoover ..... White .....McFall

WILLIAM H. RICHARDS, gen. mgr. of the paperboard mill and West Coast divisional mgr., joined CCA in 1946 as a trainee at Philadelphia. He became asst. paper mill supt. in 1947 and upper mill supt. in 1948. In 1952 he went to Los Angeles as mill mgr., became asst. plant mgr. two years later.

FRED P. RITCHIE, plant mgr., was formerly asst. supt. at Los Angeles.
EMIL PADAVIC, technical director, was transferred from the central lab in Chicago.
OWEN REEVES has moved up to technical supt. of the new mill from Los Angeles trainee.
GORDON HEALEA was asst. supt. at Los Angeles until made supt. at Santa Clara.

JAMES P. HOOVER is a trainee in the mill. . . . LESTER P. WHITE, plant engineer, was formerly maintenance engineer at Los Angeles and served as project engineer during the Santa Clara construction. He joined CCA in 1950. . . . JOE B. MCFALL, master mechanic, was formerly an engineer for U. S. Plywood.



SUPER WIDE ANGLE CAMERA CAPTURES FULL SWEEP of new No. 10 Rice Barton machine soon after shakedown run at Ecusta Paper mill, Pisgah Forest, N.C.

Exclusive to PULP & PAPER

Goal of Ecusta's New No. 10

. . . is to pioneer new markets in lightweight printing. Highlights:

1. Stock prep simple, direct. 2. Widest for its grades. 3. Approaches full automation. 4. Blanket lighting. 5. Roll handling by remote control

• Cigarets and a six-foot German immigrant named Harry Straus, who came to this country to learn to speak English when he was 18, created Ecusta. It was the late Mr. Straus who carried out the idea of manufacturing cigaret paper in the U.S.

Until he came along the French had a monopoly on the art. He led a frustrating seven-year search for a substitute for linen rags, original ingredient of cigaret paper. Then he built Ecusta and American-grown flax was his raw material.

Perhaps the most dramatic aspect of his search is the fact that the mill started up on the very day World War II began—cutting off the supply from overseas.

Ecusta (Cherokee for "Rippling Waters"), which has been a division of the Olin Mathieson Chemical Corp. Packaging Division since it was purchased in 1949, has spread a lot since it made its mark as a cigaret paper manufacturer. Much of this can be credited to Olin Mathieson, which is gradually and without fanfare diversifying its forest products to the extent of actually creating new markets (See "Olin's Answer to Recession," PULP & PAPER, Oct. 1958). Ecusta produces, in addition to cigaret paper, Bible paper, home permanent tissues, which must be light and air-thin and still withstand heat and moisture; one-time carbonizing papers and other products.

Now, with its 182 in. Number 10 machine on the line, Ecusta is aiming its big gun at a new market—the lightweight printing paper field, which has been limited in its uses until now.

Why did Harry Straus' venture take seven years? Of all papers, the wrapping around your cigaret is one of the most difficult to make. It must be thinner than the diameter of a human hair; elastic enough to stand the pull of the cigaret making machines (or able to support about eight pounds on a strand the width of an unrolled cigaret); it must be opaque, pure white, fold without tearing and —above all—be tasteless.

For years an industry which contributes some $700 billion a year in taxes to Uncle Sam, was lagely dependent on French mills. The French got most of their raw material—linen rags—from peasant rag pickers in the Balkans and Poland. As a saleman for companies selling cigaret paper and cork tips, Straus decided to skip the preliminaries and make paper from flax fiber. He hired chemists and engineers who found the answer in seed flax straw, a product considered worthless to farmers in the past. The flax

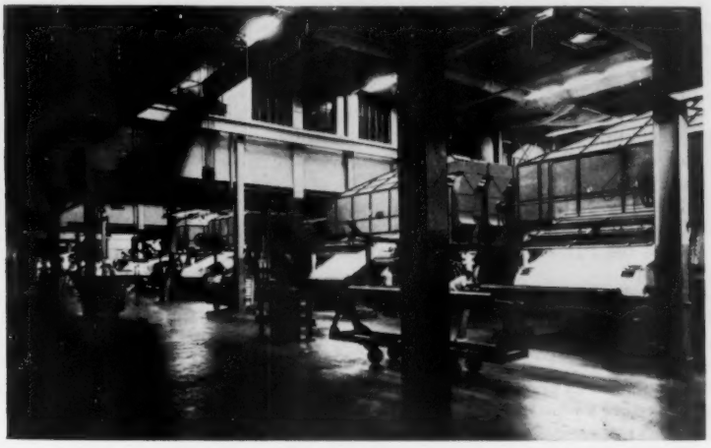
is separated in a washing process from the wood.

The mill location at Pisgah Forest, N.C., was one of 60 investigated before the mill was built. Its main attribute was water which pours down from the mountainous Pisgah National Forest and is extremely soft, free of iron and other minerals which might give the paper a taste. Then, too, in its present location, Ecusta preempts the danger of any other industry locating between it and the watershed.

The mill was completed in 1939 and the North Carolinians to man it, most of whom had never worked in industry, were taught their new trade by French artisans brought in for the occasion. The original $2 million for building Ecusta was loaned to Harry Straus by leading American tobacco makers just a few months before Munich.

Ecusta today is still the leader in manufacture of cigaret papers—enough for upwards of a billion cigarets a day. But its diversification in the past—and the plans Olin Mathieson has for its new machine could make it a leader in other new markets.

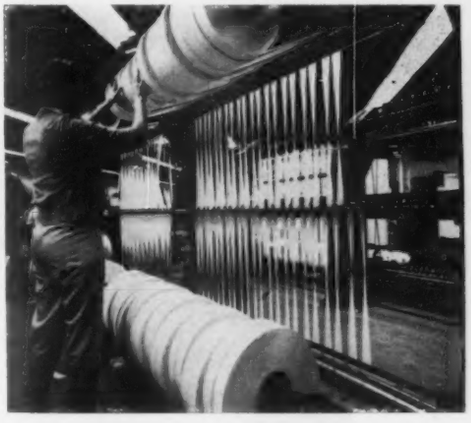
These Developments Played a Part in Ecusta's Growth



IN ORIGINAL MILL, NINE PAPER MACHINES produce Bible and one-time carbon paper in addition to cigaret. This allowed expansion outside "smoking" field.

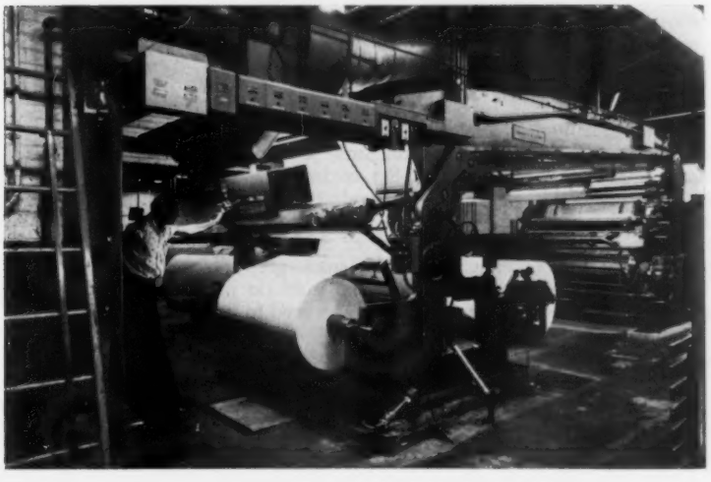
PRODUCTION LINE METHODS were adopted in making endless belts, a device permitting tobacco and paper to be blended into a single unit.

INSPECTING BOBBIN of cigaret paper. Finishing Supt. R. F. Colwell holds enough paper for 70,000 cigarets.



FURTHER DIVERSIFICATION of cigaret paper use widened market even further. Here, cigaret is rewound for home-permanent, nontarnish tissue.

NEW KIDDER FOUR-COLOR PRESS enables Ecusta to double printing capacity of packages used for roll-your-own cigaret packs, other specialties.



SCANNING WRAPPERS as they move through the Kidder Press, Converting Supt. Walter Straus, nephew of Ecusta founder Harry Straus, keeps constant vigil on quality of printing. Because of thinness and products like Bible and cigaret, special care must be taken. Some special jobs have included World War II invasion currency paper, pulp used in rocket launch tubes.

ECUSTA

Big Things are Expected of Olin's No. 10 Machine

● Number Ten machine, 182 in. wide, was designed quietly and without fanfare to be a large-scale producer of lightweight papers. The reason: To more fully diversify Ecusta products, which for years have been dependent mainly on the cigaret industry. No. 10 follows nine much smaller machines designed mainly for making of cigaret. The initial paper division was comprised of four little Fourdrinier machines in 1939, with the other six coming on line during various expansion programs.

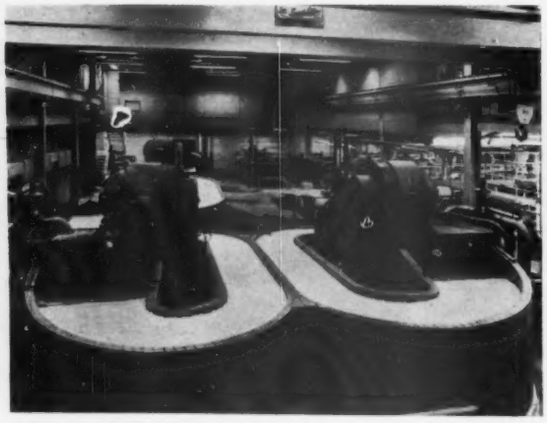
With No. 10 designed to produce high quality and quantity lightweight grades, Olin Mathieson has assigned the task of building an effective sales force for the product to W. E. Zimmermann, now director of marketing the Ecusta Paper Division. His sales staff has grown appreciably since he was assigned the task several months ago. What will be expected of No. 10?

"Well," Mr. Zimmermann, told PULP & PAPER, "what we needed was a machine suited for other types of papers than cigaret and Production says we have it. Barrington Associates made a study of the lightweight field which indicates to us that there is potential growth in lightweight papers. We are one of the few mills in the country specializing in these papers. One-time carbon is already a large field and it's growing every day. We feel a real future is also in the lightweight printing field."

In the past, use of lightweight printing papers has been pretty much limited to Bibles, manuals and other lesser volume publications. One reason there is growing interest in its use as a publishing medium is increasing costs —in packaging, mailing and shipping. Many publishing houses have had to reduce bulk and weight appreciably to stay in business. This has been particularly true in the case of direct mail, catalog and advertising houses. Unfortunately the use of lightweight printing papers has been limited by technical barriers.

In the past two years, while progress on the machine continued, Ecusta has been working with others to overcome some of these technical barriers. Present papers can be printed with half-tones on either letter press or offset. The use of color on lightweight papers, too, is improving. It can now be color-printed at high speeds although process and full-color photography reproduction is still in the experimental stage. With the progress that has been made, Ecusta feels it can now move briskly into the textbook, annual report and prospectus field—a healthy market and

1. Stock Preparation is Simple, Uncluttered, Direct



THREE 2000 POUND BATCH BEATERS MADE BY E. D. JONES ARE DRIVEN by 400 hp General Electric motors. The beaters dump into a chest with a nine-ton capacity.

THREE JONES IMPERIAL JORDANS have 350 hp drives and Accru-Set controls. One is hydrating refiner, other two can be used from stock prep panel refiners or from machine panel as ticklers for the machine.

An uncomplicated straight-line flow from the pulpers through the machine features the stock preparation system for No. 10 machine at Ecusta. The fully-instrumented stock prep room is on the same floor as the machine and directly behind it. No walls confine the room and the effect is an easily accessible area. In addition most of the dump and storage chests protrude above the floor level and are clearly marked, making it easy to visually check stock levels at all times.

Using purchased bleached and unbleached pulp, Ecusta is producing a high brightness sheet, reported to be in the 89 to 93 range, on No. 10. The pulp is delivered by an Alvey Ferguson conveyor from basement storage to the Jones Hi-Lo pulpers from which it goes to the Jones beaters—then to a 9-ton capacity dump chest.

Refining is carried out through three Jones Imperial jordans, each equipped with Accru-Set controls. One of the Imperials is a hydrating refiner while the other two can operate either as cutting refiners or ticklers. Control is either from the stock prep graphic panel or from the machine panel if the refiners are to be used to feed the machine.

Liberal use has been made of stain-

MEN WHO WILL DIRECT producing and marketing lightweight paper inspect one of first rolls. (L to r) W. E. Zimmermann director of marketing; Phillip Brownell, V. P. and mgr. of Ecusta div. and Arthur Loeb asst. mgr.

STUDYING BLUEPRINTS to search out start-up "bugs" (l to r), Prod. Mgr. Lee Bauer confers with Mfg. Supt. Tom Ramsey, Process Engr. J.F. Ferrell and Asst. Paper Supt. C. Nelson.

a new one for the lightweight paper maker. To tap the market, Ecusta set up a nationwide distributorship, directed by Mr. Zimmermann and selling through recognized merchants.

No. 10 machine can operate well on heavier grade papers which are still considered in the "light" field and produce them economically. This is possible because of No. 10's long wire, breaker stack, two calenders and horizontal size press. No. 10 required no increased power or water capacity. Ecusta's steam and power output is currently about 14,500 kw and its water treating plant has a 25 million gal. day capacity, some 8 million gal. more than the present demand.

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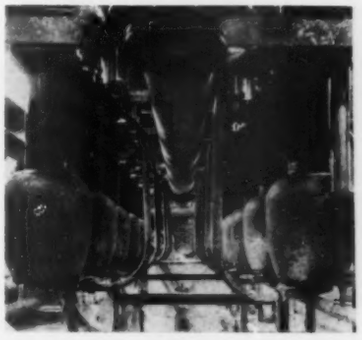
less steel to insure cleanliness and corrosion-free operation. All process piping and water lines over three in. diameter are 316 ELC stainless, fabricated by W. L. Rives Co., Jacksonville, Fla. Copper is used for filtered water lines under 3 in.

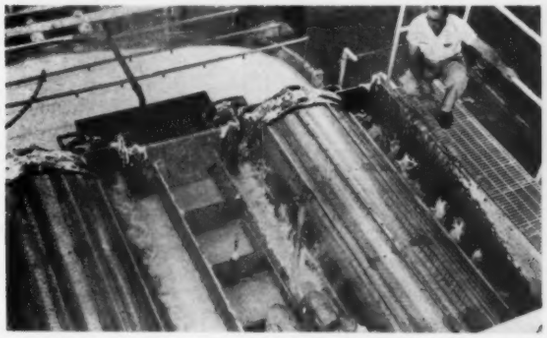
Stock is cleaned in a 3-stage Dirtec set-up with 12 primary, 12 secondary and 3 tertiary cleaners. From there it is pumped to stainless steel Bird screens ahead of the machine. Bird savealls recover stock from couch pit.

Nerve center of this fully automatic operation is a metering system comprised of two Trimbey proportioning units. One proportions stock, broke and size and the other proportions filler and alum to this blend and delivers stock to the fan pump in the precise ratio and quantity desired. A Foxboro magnetic flowmeter records flow to the machine headbox. The flow is controlled by a DeZurik V-port valve adjusted by the machine tender. Throughout the stock prep system, DeZurik consistency regulators, DeZurik stock valves and stainless steel Fabri-Valves are used.

Chas. T. Main, Inc., Boston, Mass., were consulting engineers for this entire project. Building construction and equipment erection were by Daniel Construction Co, Greenville, S.C.; Tompkins-Beckwith, Inc., Jacksonville, Fla., did the piping and Bryant Electrical Co., Greensboro, N.C., handled electrical work.



TWELVE PRIMARY and Twelve Secondary Dirtec cleaners are backed up with three third-stage cleaners to guarantee spotless stock.

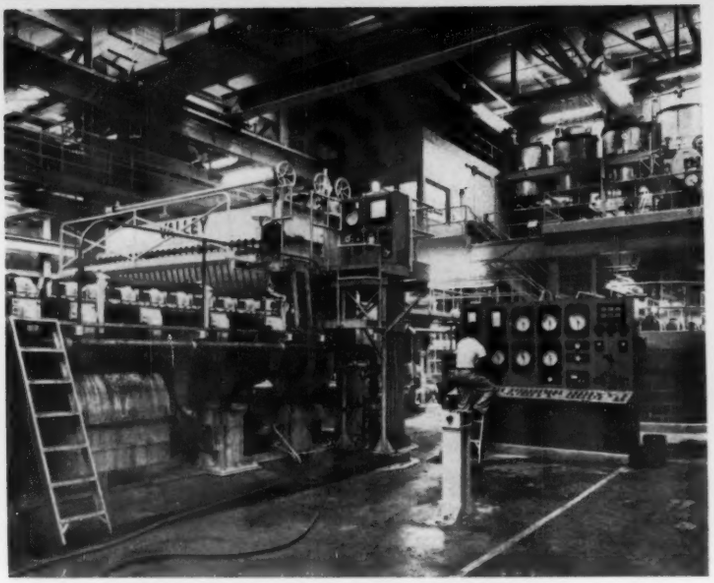


INTEGRAL PART OF CLEANING set-up is screening, handled by stainless Bird screens directly ahead of the machine on the operating floor of mill.

NERVE CENTERS OF STOCK PREP are twin Trimbey metering systems, located on mezzanine. This one controls color, broke, size; the other filler, alum.

ECUSTA

2. What Makes No. 10 Run



DESIGNED FOR ULTIMATE SPEED of 1150 FPM, (extremely fast for lightweight fine papers), machine has a Valley Iron Works inlet. Its removeable Fourdrinier is 182 in. wide, 108 ft. long with 30 ft. forming area.

"One thing we know for sure, we have ourselves a machine with tremendous potential." So commented Arthur Loeb, assistant manager of Ecusta Paper Div. It is also a machine designed to do some things never tried before in the industry—it is the widest machine in the world (182 in.) for the types of paper it makes and is expected to be the fastest for this purpose. As such it carries its share of headaches.

"There's an old Swedish saying," said Mr. Loeb, "that troubles multiply by the cube of the width of the sheet. And this is far wider than anything we've ever worked with before." This was a problem which the production staff knew it would have to face before the machine was even off the drawing board—but they have managed to master it.

What is this machine like? Well, it is designed basically for production of lightweight papers at a high rate of speed, producing at present one-time carbon and Bible papers. It has a 6-strip forming board, 10 deflectors and a Sinclair motor-driven dandy roll. All the hydraulic controls throughout the machine are mounted on consoles and placed at convenient points.

Facts on Breast Roll and Couch

The duplex breast roll arrangement (Rice Barton patented) features a 24 in. primary and 14½ in. secondary roll, with the first shake connection between the two at a location in proportion to the mass of each roll. The second straightline shake is at the division of the shake rails.

The couch is a 36 in. dia. Beloit type with provision to adjust the width of the box opening from 6 in. to 10 in. Because of the wire length, two stretchers are used, one of which is equipped with manually operated gear adjustment while the other is hydraulically operated.

The machine's 30 high pressure paper dryers and 4 felt dryers are divided into three sections; 13 paper and 2 felts in the first section; 9 paper and 2 felt in the second; 8 dryers in the third. The latest improved telescopic-type Vickery conditioner is used on both press felts. The breaker stack, between first and second dryer sections, has rubber-covered rolls, the top one hydraulically operated. The second press has been arranged to permit installation later of a suction roll.

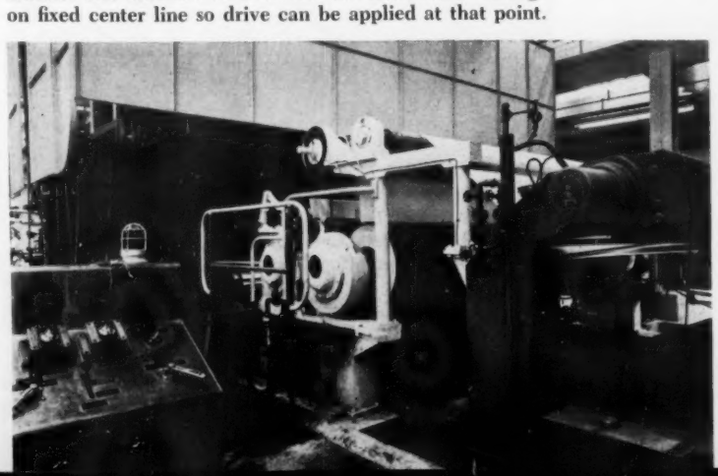
Felts are guided by Rice Barton air operated guides and tension on all dryer felts is pneumatically controlled. Endless dryer felts can also be used if so desired. Dryers are also provided with rotary siphons and compensating

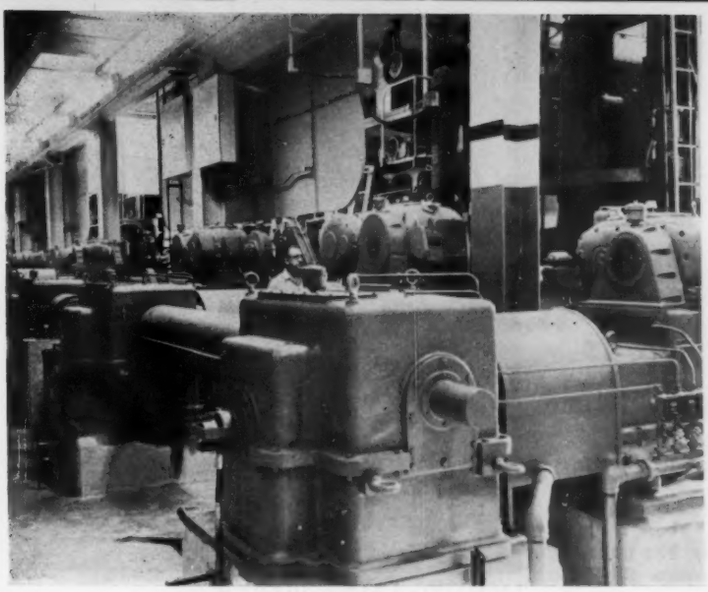
3. Instrumentation Approaches "Full Automation"

With the advent of each new mill or machine, the industry seems to approach closer and closer to full automation. Ecusta is no exception. From baled pulp storage to finished paper, the No. 10 machine was designed to take full advantage of the lastest electronic advances. Automatic controls "supervise" process flow, keep the specifications for the sheet constant. Carefully monitored, the machine furnish is prepared and delivered to the machine through instrumentation. Should the system break down, a chain reaction in reverse is set in motion, reducing process flows and cutting off production behind the breakdown. At the same time alarms sound.

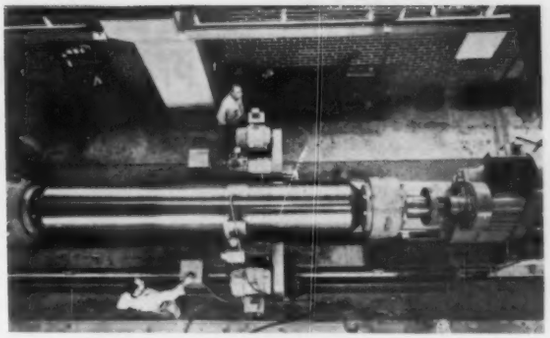
One of the key instruments in this system is the Taylor Transcope. This is one of the first uses made of it in the industry. The Transcope is a miniature unitized recorder which plugs in, permitting quick changes. Transcopes are an integral part of the graphic panel which is the heart of the preparation system. These small recorders fit easily into the schematic panels, fabricated by the Whitnor Co., Revere, Mass., and Apex Electrical Corp. of Lynn, Mass., keep a constant record of each process. This philosophy of complete instrumentation is carried down to individual machines: i.e, the Brokemaster which automatically meters itself, cuts off when necessary, starts up automatically.

SHEET LEADS VERTICALLY DOWN into nip of Rice Barton horizontal size press located behind second dryer section. The second roll is carried on antifriction bearings on fixed center line so drive can be applied at that point.





MACHINE DRIVE is Rice Barton hypoid type with differential draw control. On each output shaft is air-operated clutch connecting to differential assembly for controlling draw between machine units.

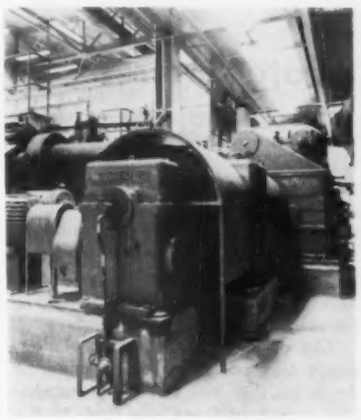


LOOKING DOWN ON Lobdell United roll grinder shows its location below the operating floor behind the rewinder. It is working on a king roll.

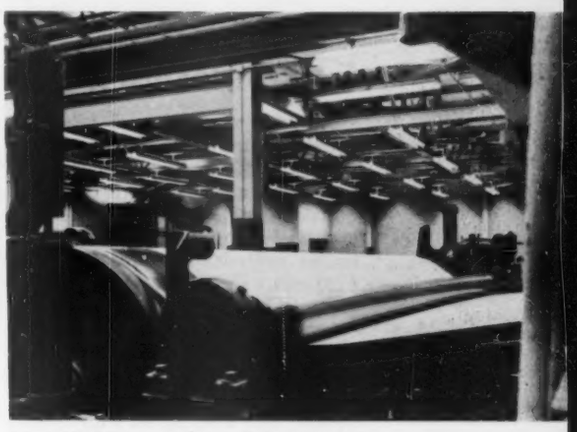
air loaded steam joints. Moisture control is by Stamm. Air system was provided by J. O. Ross Engineering using partially enclosed hoods.

Antifriction dryer bearings and calender bearings are SKF and are lubricated from a Bowser pressure system which has capacity enough to serve the calender bearings, too.

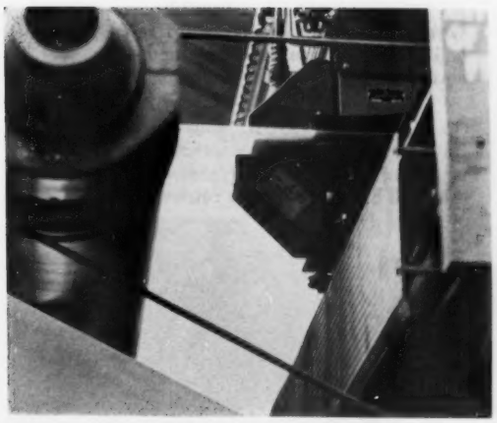
This, then, is the machine Ecustans are well proud of. It is teaching them new tricks, too. The smaller machines have felt rolls weighing only about 100 pounds, easily handled by one or two men. But No. 10 has 1400 lb. felt rolls requiring a special handling tool for installation, quite a different picture when changing an endless felt.



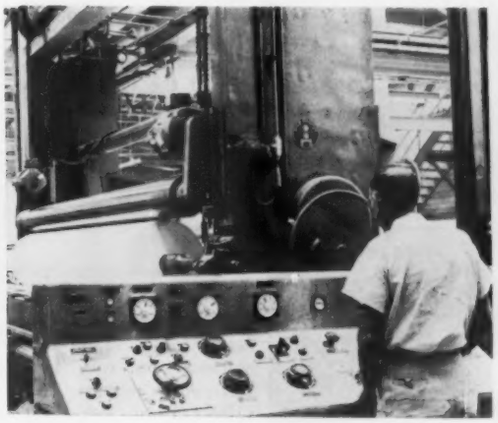
RICE BARTON HELICAL SYSTEM has Cleveland Worm and Gear reducers to permit further separation between dryers than usual, plus smoother, more silent operation.



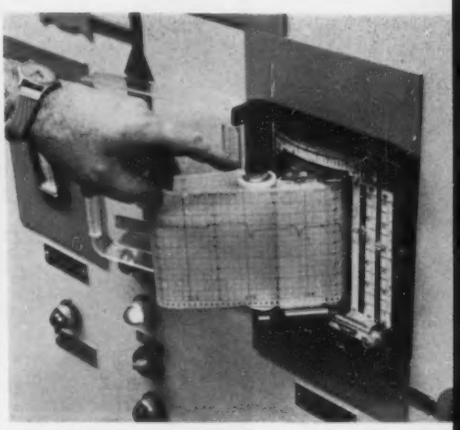
MT. HOPE expander roll keeps tension on sheet before it goes into horizontal reel following second calender. Automatic starter turns empty spool before it contacts braking drum.



BETA RAY GAUGE (Curtiss Wright) scans sheet before it enters second calender, records direction and cross-direction basis weight. Ecusta had first prototype of this machine.



"WE CAN CONTROL TENSION to the nth degree with differential drive on winder," says Prod. Mgr. Lee Bauer. Single variable speed motor drives two drums.



NEW TYPE MINIATURE TAYLOR RECORDERS are used throughout system. Plug-in permits fast change. This is one of the first used in the industry.

4. Blanket Lighting Prevents Blind Spots

Among the more unusual aspects of the new machine room is the lighting, which features a new special type fluorescent tube by General Electric. The ceiling of the entire machine and stock prep room is a blanket of lights, spaced so as to give even, bright illumination to the entire operating floor. The lights are so carefully spaced that the needle on an exposure meter varies very little at any spot in the room.

In addition, attention has been paid to areas which normally are strictly "in the dark" in most mills: Fluorescent tubes cast even light under the machine hoods, over most of the pumps and valves in the basement and even in the broke pit. There is good lighting over the chests. The uniform lighting is not only more effective but is cheerful, adds to the overall efficiency of operators.

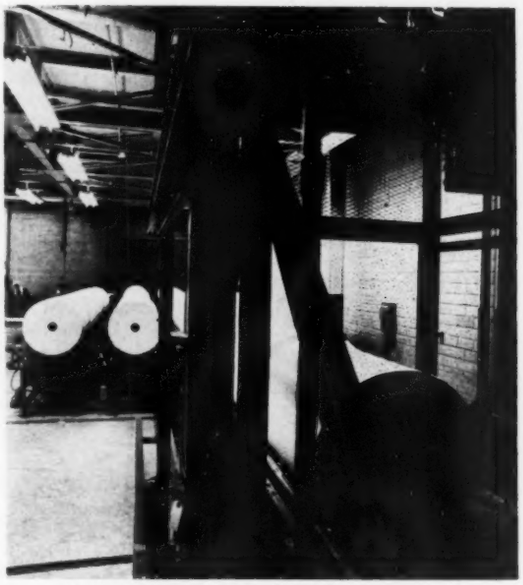
LIGHTING UNDER HOOD is one of special features of No. 10 machine.

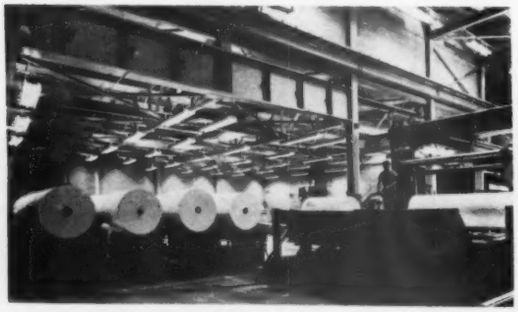
5. Roll Handling by Remote Control

A virtual shuttle line of conveyors carries finished rolls from the rewinder to the storage warehouse a floor below. This roll handling set-up is controlled by one man located in the warehouse area who keeps rolls moving by push-button controls. Designed by Alvey Ferguson, Cincinnati, O., the conveyor system features a series of belt conveyors and moving tables plus a lowerator which connects the two floors.

The drop table which accepts finished rolls is equipped with Toledo scales for weighing the rolls. The entire table is pulley-drawn from the rewinder to a position in front of any of four stationary tables which are also equipped with conveyor belts. Once weighed the roll is dispersed sideways onto the designated waiting station. At the other end a similar moving table picks up the roll and delivers it into the conveyor-equipped elevator. Electric eyes kick off the necessary conveyor mechanism to keep the rolls moving.

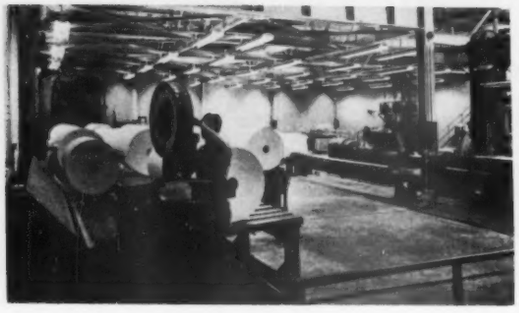
The operator, on the floor below, needs only push the button when he needs another roll to set the mechanism in motion. At the foot of the elevator a final conveyor takes the roll and delivers it to a designated pickup station.





1

DROP TABLE with scales attached moves from rewinder on tracks to position in front of any of the four stationary conveyor tables for roll dispersal.

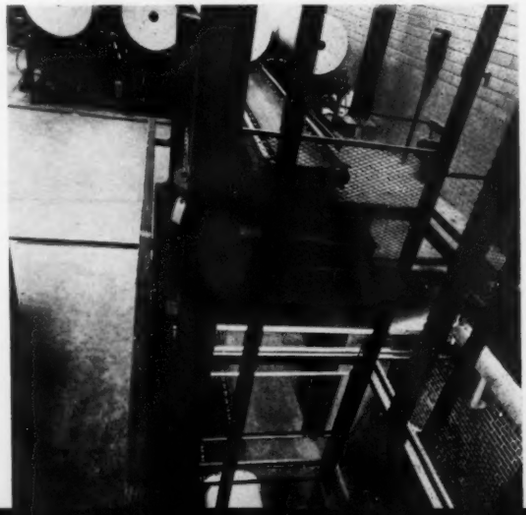


2

AFTER WEIGHT IS RECORDED and stamped on roll, belt conveyor moves roll sideways to stationary tables, also equipped with belt conveyors.

3 **AT OTHER END OF TABLES, conveyor table on tracks picks up rolls and transfers them into elevator also equipped with conveyor platform.**

4 **ON LOWER FLOOR, rolls move from elevator to still another conveyor for trip into storage room where they will be earmarked for converting.**



Outcome of 1959 Paper Week:

1. "Subdued optimism" generated at business meetings

2. Industry on threshold of major engineering advances

—New York

- **Subdued but confident optimism marks Paper Week, 1959**
- **Report of high-speed (5,000 fpm) multi-wire Fourdrinier**
- **Intense interest in European Common Market**
- **New U.S.A. capacity survey shows 2.6 million tons increase**
- **Many major breakthroughs in manufacturing techniques coming**
- **Survey of 140 all-synthetic dryer felts used in Europe**
- **Swedish research laboratory reports on sulfite cooking**
- **Two 10-point programs for research men and management**
- **New sulfite and NSSC recovery plant report**
- **Business outlook for Europe is good**
- **Fiber product study by new research technique**
- **. . . and many other reports of technical studies and progress**

● The general reaction of the United States pulp, paper and paperboard industry to its 1959 "Paper Week," now several weeks past, is a subdued but a confident optimism. What more than 3,500 readers of the industry and affiliated companies saw and heard in New York during the many events of that last week in February, sent them home with assurance that (1) not only is their business generally getting steadily better, but (2) this industry is on the threshold of revolutionary technical and engineering advances.

As the reelected spokesman for management, John R. Kimberly, (Kimberly-Clark Corp. president and chairman), beginning his second year as president of the American Paper & Pulp Assn., told PULP & PAPER that the outlook is encouraging and that he sees no reason at this time to change his recent forecast of a probable 5% to 7% increase over 1958 production and sales. Production of somewhere around 32.5 million tons of paper and paperboard is anticipated in 1959.

This would be a new all-time production record, resuming the upward march which brought four successive record-breaking years 1953 through 1956, when 31.4 million tons were made. Then came 30.7 in 1957 and 30.8 in 1958. On the basis of 1952 data, the Stanford Research Institute's now historic forecast had not anticipated a 32 million-ton year until 1960.

But production and sales, while improving, do not tell the whole story today. There is (1) still over-capacity, (2) still a jolting drop-off in profits (though some relaxing of the profit squeeze this year is foreseen) and (3) still the persistent threat of inflation.

An accurate appraisal of Paper Week must also take into account the industry's newly announced capacity plans (up 2,595,000 tons for paper and paperboard by 1961) and its impact upon the European Common Market and proposed Free Trade Area (seen as a $100 million market for the U.S.A. by one report).

Other important factors to be weighed are the industry's ability to create a better "industry image" comparable to that of the chemical and petroleum industries, to attract competent technical and management personnel.

During Paper Week, the New York newspapers came through with a few sensational reports again, as they usually do each year. This time they envisioned an "economic war" with Russia, threatening to wreck the pulp market. Cooler heads in the pulp industry said the size of Russian pulp shipments here will not have any such effect, and that any such development was unlikely for several years, at least.

Kimberly

Whitaker

JOHN R. KIMBERLY, chairman and president, Kimberly-Clark Corp. begins his second year as president of the American Paper & Pulp Assn. HOWARD E. WHITAKER, chairman of the board, The Mead Corp. is first vice p.esident.

Conflicting Views on Pulp

At the woodpulp meeting, more than one point of view was expressed. There was definitely a sharp difference of opinion between recognized authorities and leaders on just how good the immediate year ahead would be—from optimism to mild pessimism. As this happened in closed meetings, no details were available. Market woodpulp mills were expected to carry on at about 80% of capacity, according to one authority. Over-capacity is definitely still a problem and all the recorded data of the past 20 years shows the opportunity for growth of North American market woodpulp business lies overseas, not in the United States, where the market has been relatively static. A sharp upturn in pulp in the last quarter of 1958 was cheering, as it brought total U.S.A. production to about 21,634,000 tons, just 61,000 less than in 1957. Imports were down only 49,000 tons to 2,057,000 and exports slid off only 90,000 to 506,000 tons. Pulp exports were often as low as 40,000 tons in the 1950's, but during this decade climbed to new records almost every year.

Bright Outlook For New Production Techniques

The outlook for phenomenal engineering and technical advances—which, in aftermath, now looms as the brightest picture of all to unfold at the New York meetings in late February—was summed up best by Karl O. Elderkin, president of Bowaters Research and Development Corp., Inc., as he received the 1959 TAPPI Gold Medal from the hands of Gunnar Nicholson, Tennessee Paper Mills Inc. president, and the 1954 winner.

This is what Mr. Elderkin pictured for the future:

1. Growth of better fibers (better trees) for papermaking as a result of the current "onslaught of geneticists" attacking this problem.

2. Continuous and faster cooking methods that will produce better and cheaper products.

3. New types of sheet-forming machines—the days of the Fourdrinier, as we now know it, are numbered.

4. Better drying methods, replacing present waste of "thousands of tons of steel dryer rolls."

5. Something better than the present "pain-in-the-neck" calender stack.

6. Improvement in winding techniques.

7. Less labor in finishing and converting.

8. Push-botton grinder rooms.

9. A complete push-botton paper machine—"its not too far away."

10. Entirely new kinds of machines for this industry.

He also said wood will continue to be the dominant raw material for paper and he predicted development of new uses for paper.

Lest anyone get the idea these things are coming easily, Mr. Elderkin twice read to the annual TAPPI luncheon audience what he considered the meat of his message: That (1) we can only have what we produce, unless we take it from someone else, and (2) production is the key to a higher standard of living . . . "we can't get something for nothing."

He urged labor leaders, as well as TAPPI leaders, to adopt the philosophy of: first, to help their employers make more money, and then, to make sure of getting their share. To produce better machinery and better production methods, he emphasized, requires "the expenditure of capital money which must come from earnings."

Well-informed industry technical leaders, who heard Mr. Elderkin, told PULP & PAPER they agreed, in effect, that the only stumbling block today to running kraft and newsprint machines faster than 3000 ft. per minute is the formation problem, and a successor machine to today's Fourdrinier will solve that. Tissue will go to even higher speeds, they said, when its present barrier—at the Yankee dryer—is overcome. This may be a thin wallled dryer of new alloy. High speed electric computing systems, elimination of table rolls, completely new techniques in automation, more horsepower and less manpower will be some of developments which will bring about Mr. Elderkin's predictions, prominent technicians and engineers who heard his speech told PULP & PAPER.

A Revolutionary Multi-Wire Formation Technique in British Mill is Described

A new method of sheet forming used by a Bristol, England board mill was described in one of the highlight papers of the recent TAPPI meeting in New York.

Presented by J. J. Kelly, chief mechanical engineer, and L. A. Lawrence, research mgr., of St. Anne's Board Mill Co. Ltd. in Bristol, the paper describes a process requiring a main or bottom wire with one or more top wires—depending on the number of plies desired. Formation occurs at or about the point where the top wire joins the main wire and is associated with dewatering, which takes place upwards into each top wire by means of a sloping blade assembly known as an Auto Slice.

An experimental Inverform multi-wire Fourdrinier was built in 1951 for production of high-grade folding boards at higher speeds than were previously possible with cylinder mould units. The unit had a finished width of 20 in. and consisted of a wire part to which wet presses were later added. The process possessed a considerable speed potential, and upward dewatering and formation was considered advantageous.

In addition to lengthening and speeding up the original single- and multi-ply unit (to 2000 fpm), a high-speed prototype machine has been built for speeds to 5000 fpm.

Inverform is a means of applying pressure to a turbulent layer of pulp slurry for a very short period during the entry of the slurry into the in-running nip.

Diagram shows elementary arrangement of one Inverform unit.

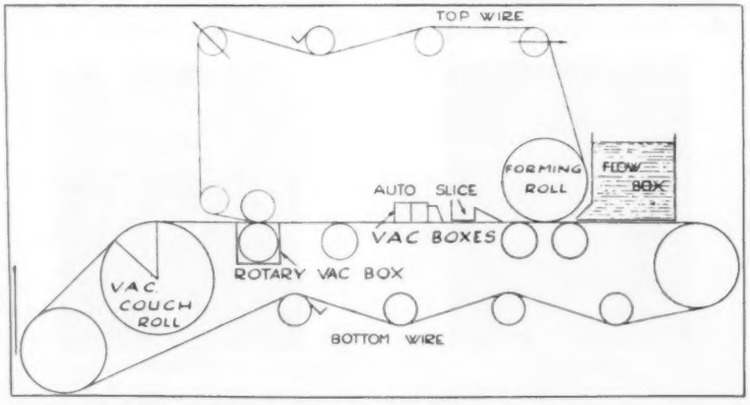
Stock flows onto a bottom wire immediately before an in-running nip created by the top wire passing around a large-diameter forming roll. The bottom wire is supported under the forming roll by large-diameter table rolls, and the two wires—with stock between them—pass to the Auto Slice, which is a stiff bevelled scraper blade pressed lightly against the inside of the top wire.

Water forced upwards through the top wire is swept up the sloping blade into the tray, from which it is returned to the pit.

In the case of a single-ply unit (or the first unit of a multi-ply machine) some water naturally passes downward; but, after the first ply is placed on the bottom wire, the great amount of water must be extracted upward.

If the speed is too low, the water extracted by the Auto Slice has insufficient energy to travel up the sloping blade. At speeds slower than 800 fpm it must be assisted either by a revolving brush roll or by suction.

Following the Auto Slice, dewatering is accomplished by inverted suc-



ELEMENTARY ARRANGEMENT OF INVERFORM UNIT for multiple wire forming at St. Anne's Board Mill, Bristol, England.

tion boxes. In the case of single- or first-ply operation, ordinary flat boxes are used.

Finally, the sheet is pressed by a rubber-covered baby press roll, the bottom roll being in a suction box, the top one fitted with a suction slice. Helper torque must be added to the top wire at one or more points as desired.

Synthetic Dryer Felts Pay Off in 140 Mills

The economic success of all-synthetic dryer felts was assessed by Dr. Edward Race, research director, Scapa Dryers Ltd., at the annual TAPPI meeting in New York. In a survey of 700 all-synthetic dryer felts used in some 140 mills in 19 countries (excluding U.S.A.), he reported that 80% were economically successful; less than 6% too costly.

Five years ago, recalled Dr. Race, Scapa decided that the all-cotton dryer felt was economically obsolete and that the future lay in either all-synthetic or blends (synthetic-cotton or synthetic-blends). Today, in their dryer felts they use blends ranging from 10% to 100% synthetics. Dr. Race was associated actively in development of the world's first all-synthetic dryer felts.

Reasons for the shift by some mills to synthetics, explained Dr. Race, are their longer service life and more efficient water removal properties requiring less steam consumption and improved drying across the sheet. The synthetic hydrophobic fibers, he said, absorb and retain very little by natural regain; don't swell when wet; moisture is held by interfiber capillarity and they are not contaminated by oil.

The synthetic fibers referred to by Dr. Race are nylon and Terylene, which he says is comparable to the DuPont fiber Dacron. Scapa is at present experimenting with a heat-resistant nylon.

The average initial cost of the all-synthetic dryer felt is about 2.5 times the cost of an all-cotton dryer felt; about twice the cost of a synthetic reinforced felt, but about 10% lighter in weight. At that rate, said Dr. Race, the all-synthetic felt should have a service life 2.5 times the all-cotton felt, twice that of the synthetic reinforced. Scapa produces 18 types of synthetic cotton dryer felts.

Word of Caution

There are many variables attendant to the success of a synthetic dryer felt, stressed Dr. Race. "A papermaker does not consider that wool is useless as a raw material for press felts because he found a particular press felt insufficient on his machine. Similarly, he cannot condemn all-synthetic dryer felts in general because a particular type of synthetic dryer felt under given conditions does not insure the success of any type of all-synthetic dryer felt under the same conditions."

The use of synthetic dryer felts has traversed three trends, said Dr. Race. First, the all-synthetic felt, although made on the principles of the cotton dryer felt, has been used to clothe dryer positions previously clothed by woolen dryer felts. Next, the all-synthetic felt has been used to clothe dryer positions, previously clothed by the finer types of cotton dryer felt, on machines producing medium fine papers. Finally, the all-synthetic felt, made in the most stable structures and equipped with a mechanical seam, is used to clothe positions on wide, fast-running newsprint and kraft machines.

Dr. Edward Race of Scapa Featured Speaker in U.S.A.

Dr. Race has been research director for 11 years of Scapa Dryers Ltd., Blackburn, England. He is also vice president of Scapa U.S.A. At the U.S.A. industry's annual meeting in New York in late February he discussed the advantages of all-synthetic dryer felts, pioneered in world paper mill and board mill use by his company. He has toured the world for Scapa, lecturing on felt problems, and is to address a meeting on the U.S. Pacific Coast in May. Born in Wingate, England, he studied biochemistry at Durham University and later was on the staff there. Before joining Scapa he was senior lecturer on textile chemistry at Leeds University, England.

Swedish Research Report: No-Base Sulfite Cooking and Other New Developments

Lennart G. Stockman, of The Swedish Forest Products Research Laboratory, Stockholm, reported during the TAPPI meeting on studies to improve some factors which make the sulfite process extremely flexible in operation and in qualities obtainable.

Sulfite cooking without a base is possible under certain conditions by cooking with SO_2 alone. This yields paper and viscose pulps with normal yield-chlorine number relationships and normal characteristics. Advantages cited are elimination of limestone costs and handling, simpler absorption apparatus in place of acid towers and possibly also a lower SO_2 consumption per ton of pulp and a higher sugar content in spent liquor.

Main disadvantages, he said, are the higher pressure required (220 psig) and hot acid tanks, or alternatively, the longer cooking time (5 to 10 hours).

Two Stage Cooking

Advantages for using a two-stage sulfite cook, said Mr. Stockman, are higher yields, increased raw material base and greater flexibility in grade of pulp obtainable. Even woods such as pine that contain phenolic substances, and so-called bark-damaged wood can be pulped. Cooking conditions in the two stages can be varied independently within wide limits and thus allow great freedom in choice of pulp grade. "It allows production of very high hemicellulose pulps but it is of course also suitable for viscose pulps," reported the Swedish chemical engineer.

Single Stage $NaHSO_3$

This process gives high yields (58-60%) of bright chemical pulps with excellent strength properties approaching sulfate pulp. Using spruce and a solution of pH about 4 at room temperature, no mechanical defibration was required. Cooks made with Na_2-SO_2-SO_4 is, in principle, equivalent to an ordinary sulfite cook, said Mr. Stockman, since the bisulfite and hydrogen ion concentration can be made almost identical in the two cases. Cooks made with this solution with both paper and viscose pulps showed no detectable difference in quality between pulps prepared by cooking with ordinary sulfite solution.

LENNART G. STOCKMAN, Swedish Forest Products Research Laboratory, Stockholm, reported on sulfite pulping progress.

Favorable Report On Progress of New Recovery Plant for Sulfite and NSSC

Favorable process conditions for liquor treatment and evaporation is made possible by sustained operation recycling sodium sufide. This was the view expressed in a paper presented at the recent TAPPI meeting in New York, by S. R. Parsons, supervisor of research for Consolidated Water Power & Paper Co., (Wisconsin Rapids, Wis. U.S.A.,) and R. Q. Boyer, mgr. of the chemical process dept., Western Precipitation Corp.

Discussing the experimental operation at Consolidated's Wisconsin Rapids, Wis. plant, Mr. Boyer pointed out that settling the spent mother liquor mixture removes all particulate material that might interfere in the subsequent oxidizer reactor or evaporators. The exception is pulp that is removed with a side hill saveall.

The chemical action in the oxidizer is so complete that only a trace of iodine titratable sulfur is found in the evaporator condensates, and there is no pungent odor to the condensates. The reacted liquor from the sustained process acts similarly to kraft in standard kraft LTVs to 50% solids outlet concentration.

Plant Operates on Sulfite and NSSC

The Consolidated plant—designed for expansion—was completed in June 1958 and has been operated on acid sulfite and NSSC spent liquor singly and in mixtures. Sustained operation conforms validly to the original flow sheet. Data obtained is also significant to kraft recovery.

That sodium sulfide is at least no more corrosive than kraft is shown by the satisfactory present condition of the first-effect mild steel tubes following more than a year's operation.

The forced circulation evaporator concentration even when the liquor takes the liquor from 55% to 65-70% has added to it the mechanically-collected soot plus saltcake equivalent to a precipitator catch.

There is appreciable entrainment from the furnace of a Babcock & Wilcox kraft type recovery unit. This function should be a definite limiting factor to the turn up of the unit. Sustained operation confirms that furnacing the process liquor releases sufficient sodium carbonate to sustain the recovery process under wildly varying conditions.

The shot-cleaned air heater can be operated to the lowest feasible temperature (300°F.) without trouble. The equipment should be equally effective on a kraft recovery unit. This equipment in combination with the forced-circulation concentrator, should give the kraft industry an economic combination to replace the direct-contact evaporator that is a large source of odor emission. The shot-cleaned air heaters on units burning NSSC can be used as heat traps to produce 500° to 700°F. combustion air, making it possible to burn NSSC without oil.

Furnace dregs do not appear to affect evaporator-crystallizer yields as long as they are removed in the mother liquor overflow and with the sodium carbonate crystals at the same rate at which they are entering at the dissolver. Ordinarily, the sodium sulfate present stays in the mother liquor. Combined crystals and heavy dregs are filterable in a 60-mesh screen rotary filter to give a 96.5% pure sodium carbonate without washing.

Further operation of the slat packed tower will be necessary to establish the best construction materials. The most satisfactory material under test has been unfinished Consoweld, a phenolic-based paper laminate. A simple pre-coated leaf filter can be used to clarify the tower effluent after it has been reduced in pH to at least 3.8.

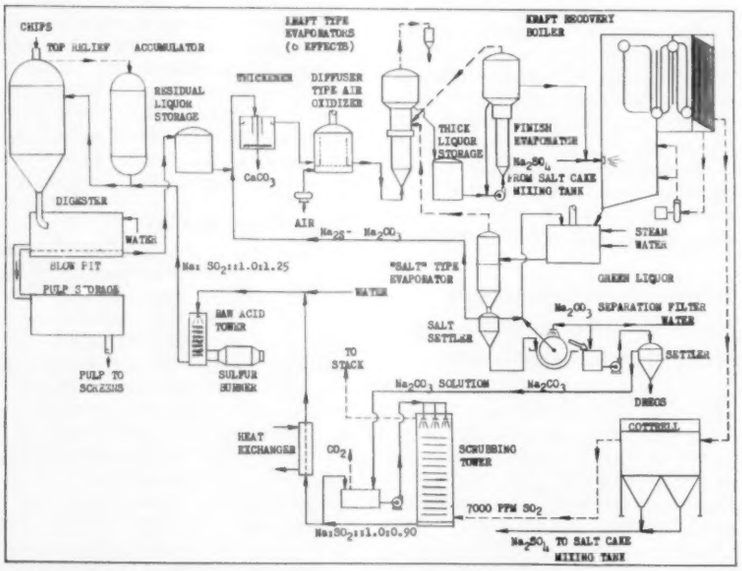


DIAGRAM OF CONSOLIDATED'S EXPERIMENTAL PLANT shows the complete cyclic process for sodium base spent liquor acid sulfite pulping.

Wiggins Teape Researcher's Report on Fiber Property Study

O. Kallmes, formerly of The Institute of Paper Chemistry, Appleton, Wis., U.S.A., and now with the Wiggins Teape Groupe Research Organization in England, reported a new technique has been developed for isolating *P*-S_1 material and S_2 material from delignified fibers in sufficiently large quantities for chemical analyses. From the analyses of the *P*-S_1, S_2 material and the original fibers, it was possible for the first time to approximate the distribution of the constituents across the wall of unbleached spruce sulfite fibres. These distributions are as follows:

The concentration of lignin in *P* and S_1 (about 5.8%) is 10 to 20 times as large as in S_2 (0.4%). The concentration of alpha-cellulose (81.3%) and of the hemicelluloses (12.9%) in *P* and S_1 are slightly *lower* than in S_2 (82.6-84.0% and 15.5-17.0%, respectively). The distribution of the hemicelluloses is consistent with the distributions of the sugars, glucose, mannose, and xylose, which are present in an essentially constant ratio (19:2:1) across the fiber wall. The D.P. of *P* and S_1, 2030, is about two-thirds of that of S_2. *P* and S_1 are partially crystalline, but not as much as S_2.

Two related experiments were carried out. (1) It was found that unravelled *P* and S_1 fragments can enhance sheet strength properties considerably. (2) Two theories on the "balloon-type" swelling were corroborated. These theories are that S_1 is primarily responsible for the constrictions observed during ballooning, and that the "skin substance" concept is unnecessary to explain ballooning.

New Knowledge on Behavior of Beater Adhesives

A. Russo, now with W. R. Grace and Co., Paramonga, Peru, and E. F. Thode, The Institute of Paper Chemistry, U.S.A., reported on the rate of sorption of a partially methylated locust bean gum (PMG bleached in a) sulfite pulp. In singling out the rate-determining factors, "infinite bath" sorption conditions were approximated; gum retentions were determined directly by use of a radiochemical tagging technique. Experiments were conducted to investigate the effect on the rate of PMG sorption of the variables time, PMG concentration, temperature, degree of agitation, and pulp specific surface area.

The observed experimental results demonstrated that the major rate-controlling factor in the overall sorption phenomenon was a diffusional transport step bringing the gum molecules from the bulk phase of the solution to the surface of the fibers.

Results of Bleaching High Yield Birch

N. N. Coe and Lance Crosby, Dorr-Oliver, Inc., Stamford, Conn., reported black birch pulp, prepared in close to a 100% yield by a chemi-mechanical process, was bleached with (1) sodium hydrosulfite, (2) peroxide, (3) chlorine dioxide, (4) sodium hypochlorite, and (5) chlorine with a caustic extraction following. Beater evaluation showed that the first four bleaches resulted in slightly improved burst, tear, tensile, and apparent density, and slightly poorer opacity as compared to the unbleached pulp. However, the chlorine-caustic bleach was very significantly higher in burst, tear, tensile, and apparent density and much lower in opacity. In brightness gain, yellowness reduction, and cost per point of brightness gain sodium hypochlorite appeared most favorable.

Systems Analyses, Computers —A Look into the Future

With systems analyses and high speed computers or tapes foreseen as making future operations "decisions" automatically in this industry—perhaps the greatest revolutionary change in the next few years—there was considerable interest in the TAPPI paper given by E. F. Thode, The Institute of Paper Chemistry, Appleton, Wis. He pointed out that systems engineering and operations research are two extensive technical fields which intersect to a considerable degree.

Whereas systems engineering deals almost exclusively with the physical realm (except where reactions of human operators must be accounted for), operations research is often more concerned with human activity than the actual operation of machines. Marketing, procurement, and finance considerations frequently outweigh technical and production problems in operations research.

Both of these fields make extensive use of mathematical models of the systems under study and quite often employ automatic computation techniques in the solutions of problems and the manipulation of models. An extensive background of experience now accumulating in sister process industries should prove very valuable to those pursuing systems engineering and operations research work in this industry, said Mr. Thode.

The application of an analog computer to a paper manufacturing problem by Kimberly-Clark Corp., Neenah, Wis., was reported by L. W. Zabel. The machine direction temperature distribution on the surface of a Yankee dryer manufacturing tissue has been calculated using the heat flow equation. This equation was solved on an analog computer by using the finite difference method. The partial differential equation was reduced to a set of 24 ordinary linear differential equations. Previously reported in these pages was the pioneering work in Sweden's Forest Products Laboratory in using a Litton analog computer to speed up drainage and flow research and assist in machine design.

Factors Affecting Printing Quality of Newsprint

R. W. Prince, ANPA Research Institute, Inc., Easton, Pa., reported some 600 newsprint samples from 54 of the 56 North American newsprint mills were obtained from 54 newspapers over a 12-month period. Fifteen physical properties were tested, utilizing equipment and techniques available to the industry.

The findings were subjected to a multiple regression analysis in the belief that good printability results from a combination of several paper properties. From this analysis it was concluded that approximately 50.0% of the differences in printability are accounted for by differences in smoothness, hardness, and brightnesss. The remaining 50.0% are attributed to factors other than smoothness, hardness, and brightness.

Mathematical analysis indicates that, of the total variance in printability on the wire side, 31.5% is due to the effects of smoothness alone, 10.0% to the hardness alone, 2.5% to brightness alone, and 14.0% to a combination of smoothness, hardness, and brightness varying together.

Scatter diagrams have been prepared, plotting each of the measured physical characteristics against measured printability. Visual examination of these diagrams indicates that porosity and opacity together may account for another 10.0% of the printability variances, leaving approximately 40.0% of the printability variances to be accounted for. Basis weight, moisture, caliper, and tear were found to be independent of printabilty.

Buckeye Researchers Develop Method For Tall Oil Estimation

Faster, safer, more accurate estimation of tall oil in kraft black liquor will be possible under a new analytical method developed by Dr. Kenneth A. Kuiken and William Saltsman of Buckeye Cellulose Corp., and reported at New York TAPPI sessions by Dr. Kuiken.

A unique solvent system permits the easy separation of tall oil from lignin. Specifically, he pointed out, definitive estimates of tall oil are obtained, laboratory time is cut about 50%, and the hazard of using volatile solvent at high temperatures is avoided under the new method.

In the usual approach to estimating fatty oil content, oils are isolated in weighable form by solvent extraction. In aplying these techniques two problems are encountered: (1) during acidification, elemental sulfur forms, which later appears as an oil contaminant that must be removed; (2) extraction of tall oil from the system is complicated by a partial absorption of the oil on insoluble lignin.

Under the new method, he reported, sulfur inclusion is avoided by oxidizing the inorganic compounds with hydrogen peroxide before acidification. After acidification, the tall oil is extracted from an aqueous-alcohol-acetone solution in which the degraded lignin residues are soluble.

JAMMED INTO THE STARLIGHT ROOF of Waldorf-Astoria Hotel, industry leaders listen to panelist David L. Luke, president of West Virginia Pulp and Paper Co.

APPA-TAPPI Panel Urges This Industry To Compete with Others for Recognition

The APPA-TAPPI Research Forum climaxing Paper Week sessions—it drew a full house of about 650 to the Starlight Roof of the Waldorf-Astoria hotel—raised the problem of how this industry can compete with others for talent and favorable recognition in colleges and universities.

Dr. John G. Strange, president of the Institute of Paper Chemistry, Appleton, Wis., moderated the session. He said there are a lot of things the industry can do. Participating with him were President David L. Luke, West Virginia Pulp and Paper Co.; President Al B. Layton, Crown Zellerbach Corp.; President K. O. Elderkin, The Bowater Research and Development Co.; Howard S. Turner, research vice president, Jones & Laughlin Steel Corp., and Lt. Gen. James M. Gavin, vice president, Arthur D. Little, Inc.

One speaker said "two distinguishing features of this industry are the use of a natural high polymer and the way this polymer is formed into a sheet." The problem, he added, is to convey this message to the young men who are majoring in engineeering and chemistry.

Challenged one panelist, "I think if anyone in this room were to be asked if the chemical or petroleum industry is a good industry to work for, he would say 'yes.' I don't think he would know why he said 'yes.' But he has read about it often enough. I don't believe the paper industry has conveyed enough information about itself to the public. The public knows too little about this industry."

Cooperative basic research was hailed as one answer to the industry's problem. One panelist said that this industry is particularly suited for cooperative research.

Another panelist said, "This country could have had a big satellite in orbit long ago if management could have understood that it could be done. (But since management did not understand), it told the people not to talk openly about satellites."

When the chips are down, said one panelist, basic research is the cheapest research that can be done. Pilot scale research is more expensive.

Cites Gains By Russia

In the opening talk of the forum, Lt. Gen. Gavin underscored the economic and research gains made in U.S.S.R. "It is high time," he warned, "to erase the old image of the Soviet peasant in a babushka. The Soviets' technical strength is great, and not only in the realm of missiles and space."

In the past three years, the Russians have been demonstrating that they can forus their efforts on any problem they choose, he said. He made references to reports of Russian price cutting in world markets.

Quality Not Quantity

The quality of research is a better criterion of a company's research efforts than the quantity undertaken, the number of scientific personnel or size or appearance of the laboratory, said Crown-Zellerbach President Layton. "Any management that neglects research will not continue to be management for very long. In fact, there might not be any company for them to manage 10 years from now."

To be truly effective, said Mr. Turner of Jones & Laughlin, research must be recognized as a top corporate function. Research must have a clear place in the corporate scheme of things and should be understood as a "learning" activity necessarily involving frequent negative results.

Top management must understand what motivates research people and understand their individual character. "Research may be expected to be most productive when in addition to appropriate guiding policies, top management has sought to achieve a working understanding of research people and of the research function itself," he stated.

Two 10-Point Programs for Better Research: One for Management, One for Researchers

President A. B. Layton of Crown Zellerbach Corp., addressing the APPA-TAPPI Research Forum in New York, set forth:

1. A 10-point list of conditions which management should create to foster effective research, and
2. A 10-point list of conditions which management has the right to expect from research personnel.

Here, first then, is his list of ten conditions that management should create:

1. Management should not regard research as just another form of overhead, to be turned on or off with fluctuations in business.
2. The program should be a broad and sustained effort, not beamed at limited problems or "putting out fires."
3. If the head of research is not a part of top management, the program should be on equal plane with manufacturing or sales, reporting direct to management.
4. Research effort should be integrated into all other corporate operations and not set apart.
5. A comprehensive system of communcations and follow-up should make sure results are disseminated and used.
6. Personnel should be given opportunities to advance into other positions in the organization.
7. Management should establish

AL LAYTON, president, Crown Zellerbach Corp. presented a ten-point code for management's dealings with research, another one for research in its relations to management.

priorities for the research projects.
8. Management should not evaluate research in the same terms of dollars and cents return on capital investment, or number of years required to pay out.
9. Personnel should be encouraged to exchange views with scientific colleagues and participate in meetings.
10. Research effort should be sincere and not primarily beamed at financial public relations.

What Management May Expect

Here, he said, is what management has the right to expect from research:
1. The objective is to return a profit in a reasonable period. A research department is created to enhance the earning power of the company.
2. A reasonable performance in solution of applied research problems. Research should not expect to have funds allocated indefinitely if it doesn't deliver.
3. The average company can only afford to have a limited amount of fundamental research.
4. Loyalty to the company in the applications of their disciplines rather than applying them in fields of particular interest to the researcher.
5. Researchers should not expect all credit from results of their research because, generally, operating, engineering and sales departments also contribute.
6. Researchers should realize in asking for funds, they are competing with all other departments which think their needs are most important.
7. Research personnel and their wives should take their place in a division and community the same as all other company employes.
8. Researchers should originate problems and projects as well as work on those from others. To do this, they must take an interest in over-all operations, problems and objectives.
9. Research personnel should not want to undertake every project themselves and resent group research efforts or having projects farmed out to other agencies.
10. Top research people should actively try to lead top management in forming the company's research program.

U.S. View of Common Market

. . . given at annual "Paper Week." Extending tariff reductions to all GATT nations is seen as significant

Perhaps the most volatile economic question in Europe today—the Common Market and its possible foster-child, the Free Trade Area—came under the scrutiny of three U.S. economists at the U.S.A. industry annual "Paper Week" in New York City in late February.

It was the lead-off man, D. F. Heatherington, director of National Foreign Trade Council's European Division, who perhaps most concisely identified the Common Market Six: "The European Economic Community is an economic means to a political end."

As he explained, the reasons for establishing the Common Market among its six members (Belgium, France, German Federal Republic, Italy, Luxembourg and the Netherlands) were removal of tariffs and quotas among the six nations, adoption of a common tariff toward outsiders and common policies on internal economic and social matters as well as agriculture and transportation. Eventual aim: In due time goods will be produced in all six countries under more or less equal conditions.

"Without a dedicated attachment or belief in this ultimate objective," he said, "the barely launched Community already would have foundered in the backwash of the Free Trade Area controversy or be on the verge of doing so."

Attempts to establish a Free Trade Area followed the founding of the Common Six, explained W. K. Hora, assistant cashier of the First National Bank of New York, to avoid discrimination by the participating nations against goods of other Western European countries.

This area would include the six Common Market nations as well as the remaining 11 Western European members of the Organization of European Economic Cooperation. Its aims: Removal of trade restrictions and other forms of discrimination among themselves. The major difference, as both Mr. Heatherington and Mr. Hora pointed out, is that while each of the Common Market Six would establish a common tariff, each of the remaining 11 would persue its own tariff policies.

What is the Big Problem?

Attempts to establish the Free Trade Area became more and more complex. As Mr. Hora pointed out, France, for instance, visualized difficulty in a trading agreement which would permit any one of the 11 non-Common Market countries with a lower tariff to ship low duty goods throughout the Free Trade Area. On the other hand, Britain objected to joining in a common tariff against all outsiders because it would conflict with its Commonwealth Preference System, i.e., it would have been obliged to raise tariffs on many commonwealth goods.

Essentially the basic difference is that Common Market nations are not merely seeking to create conditions for expanding trade but—it was said—they are also aiming at economic unification and eventual political union Countries outside the Six are either unwilling or unable to surrender any of their sovereignty even to gain the benefits of economic integration.

But the big, significant, unanswered question, said Mr. Heatherington, is whether this political factor will continue to be a real force in the community and one sufficient to hold it together against decisive, sapping pressures bound to arise from the Treaty.

Can it be Resolved?

Is there room for negotiation? Mr. Hora, for one, feels there is and advanced several possible proposals and outcomes under which this problem might be resolved:

1. Other European nations, such as Greece, second only to southern Italy as Europe's poorest area, could join the Six. As an underdeveloped country, it could benefit from projects financed by the European Investment Bank.

2. Some other form of Free Trade Area might be evolved. France, for instance, afraid of increased competition in the past, could become more flexible in the future, especially if the French economic situation continues to improve.

3. A real danger lies in the fact that Western Europe could inevitably split into two trading blocs, thus destroying one of the primary objectives of the Common Market—freer movements of goods within Western Europe. What is really at stake, said Mr. Hora, is that if part of Western Europe becomes a closed preference area, progress throughout the whole free world toward freer and less discriminatory trade would be hampered.

Heatherington ..... Hora ..... Auer ..... Sweet ..... Lagerloef

PREPARING FOR COMMON MARKET SESSION: Meeting chairman James Sweet and Eric Lagerloef, American Paper & Pulp Assn. export committee chairman, introduce speakers D. H. Heatherington, W. K. Hora and C. N. Auer, all U.S.A. economists.

Size of the Common Market

C. P. Auer, president of the U.S. Paper Exporters Council, Inc., pointed out that while geographically, the Six Common Market nations are far smaller than the U.S. (they could fit into the states of Texas, New Mexico and part of Oklahoma), population-wise the 165 million consumers living in this area are very nearly the equivalent of the U.S.

This, he said, offers a new kind of foreign market with as many potential buyers as our domestic market. And though its purchasing power is only about one-fourth the capacity of North American consumers, it is on the rise. American producers, with an eye on the future, will probably try to climb with it.

Mr. Auer's warning: The Common Market is NOT a market for amateurs. It is, he said, volatile as a rocket and new in form and only recently began realizing its own strength. American mill owners, he said, should approach this economic phenomenon through exporters who are familiar with its genesis and aware of its goals. For the next several years, he concluded, it can be a risky market in which to build; a favorable market in which to sell.

What it Means to U.S.A.

This Common Market, said Mr. Auer, offers concrete advantage to paper producers outside its borders. The first of these is a reduction on import duties (which in the recent past have been from 13% to 25% in these six countries). According to Mr. Hora, to avoid trade discriminations before a new attempt could be made to establish a Free Trade Area, the Common Market Six extended its first tariff reduction (scheduled for Jan. 1, 1959) to all nations (including the U.S.A.), subscribing to GATT (the General Agreement of Tariffs and Trade).

This tariff table is calculated to hit, by 1970, an arithmetic mean between the lowest and highest duties on foreign member nations as of Jan. 1, 1957.

While this reduction does not mean a "tariff holiday" it does represent a favorable trend and for American paper producers a fortunate "fluke of fate," said Mr. Auer. Here, he said, is why:

Paper and board consumption in the Common Market countries in 1957 was 8¾ million tons. Estimates say it may go up as much as 10% in the next decade (West German consumption is already proceeding at that pace). On this basis, consumption potential, without considering population increase, could reach 13.7 million tons by 1962 and could triple the 1957 figure by 1970, when tariff reduction is complete and a free market is envisioned.

At present the gap between production and consumption in Western Europe is a little over a millon tons and Scandinavian imports are filling this gap. The current rate of growth of the Western European industry is about 7% compared to 10% increase in consumption. If this 3% differential should continue or increase it offers two kinds of opportunities to American paper producers:

1. The obvious is to compete with increasing Scandinavian production to supply the gap.

2. Less obvious, but equally interesting, says Mr. Auer, is increased opportunity in other world markets such as South America, where Scandinavian imports are strong but could conceivably drop off if demands rise closer to home. If the Scandinavian producers choose to turn attention to supplying this increasing gap in Western Europe the South American market could become wide open for U.S.A. producers.

The Tariff Advantage

At present, the tariff situation in Common Market countries is definitely attractive to the U.S., says Mr. Auer. When Free Trade Area negotiations collapsed, the British proposed a plan under which Common Market members would extend reciprocal trade relaxations to countries which belong to the Office of European Economic Cooperation. The French opposed this plan. Had the British proposal been accepted, the Scandinavians, who belong to this agency, would have enjoyed a definite advantage over the U.S.A., which does not.

With the collapse of this "Free Trade Area" proposal, said Mr. Auer, the Common Market cast around for an alternative method of reducing its external trade walls and chose GATT, of which the U.S.A. is a member.

Mr. Auer sees in the fact that the Common Market Six chose to seek a tariff reduction alternate, these two significant factors: The first, he says, is that in doing so they testified to their determination to become an open market. Equally as important to the U.S., he added, is that the first trade liberalization step taken by the new Common Market of Western Europe has established the precedent of including North America and in so doing is a transatlantic rather than pan-European invitation to trade.

Business Outlook in Europe is Good

BY W. K. HORA
Asst. Cashier, 1st National Bank of New York

Following are comments Mr. Hora made at the American Paper & Pulp Assn.'s "Common Market" meeting during the annual U.S.A. "Paper Week":

Contrary to the general belief, the interruption in Europe's economic growth in 1958 had little to do with the American recession. It was, rather, a result of the need to consolidate gains made in previous years and to control the inflationary pressures generated by the investment boom of 1956 and early 1957.

By suppressing these inflationary tendencies, Europe was able to strengthen its international balance of payments position and to reshape its economy to conform more closely with its future needs and with the changing patterns of international trade.

With business recovering in the United States, European fears of a worldwide slump have been dispelled. This has resulted in the relaxation of some of the earlier monetary and fiscal restraints. In stimulating further economic expansion, however, European countries are bound to move cautiously despite the pressure to achieve higher living standards and to provide more jobs for new entrants into the labor market. There are indications that the revival in European business will probably begin in industries serving the domestic market. Any improvement in European exports must await an increase in the purchasing power of the primary-producing countries.

Nevertheless, even a modest expansion in Europe's economy is bound to go a long way toward helping the rest of the world. Western Europe buys some 45% of the exports of the primary-producing countries, or more than twice as much as the United States. Moreover, its purchases are much more diversified than U.S.A.

Western Europe has been one of the most dynamic regions in the world during the present decade and there is a good chance that it will continue to be so. An industrious labor force, equipped with better tools and machinery and aspiring to higher living standards was responsible for the remarkable increase in industrial production during the 1953-57 boom. Although the gap between U.S. and Western European living standards may have narrowed somewhat, a huge consumer demand for durable goods remains unsatisfied.

Common Market Means More Competition, Rodgers Tells Two U.S.A. Groups

Business will be good for the months ahead, there are many anti-inflationary forces which may keep it within bounds, and the Common Market of Europe is going to be of great importance to both that continent and the United States.

This, in essence, was the message of Dr. Ray Rodgers, professor of banking, New York University business graduate school, featured speaker at both the Sulphite Paper Mfrs. Assn. and the Glassine and Greaseproof Assn. meetings at New York's annual Paper Week. At the first, James G. Conley, Fraser Paper Ltd., chairmanned in place of Earl McCourt, Consolidated Water Power & Paper Co., unable to attend because of illness, and Ben Cancell, exec. v.p. of St. Regis, chairmanned the second meeting.

"Establishment of the European Common Market is a step of great significance," Dr. Rodgers told the G&G Assn. The reduction of tariffs and import quota barriers in the six European countries and the return of limited convertibility "will increase international competition," he said.

"Common Market countries will undoubtedly reorganize their industries and engage in mass production on a larger scale than ever before. Foreign nations selling to Great Britain and other countries with limited convertibility will now be able to buy wherever goods are cheaper or quality is higher, or delivery is quicker. As costs of production are lower in Europe and those countries are nearer to one another than in the U.S.A., it will be even more difficult for American exporters to compete abroad.

"The return to limited convertibility in West Europe means fear of a dollar shortage has now passed. It will impose on those nations the need to practice fiscal and monetary discipline in order to maintain convertibility of currencies. If inflationary pressures are not counteracted in any country by fiscal discipline, it will be unable to maintain convertibility of its currency. This will have far-reaching implications for the U.S.A."

More World Competition

Addressing the Sulphite Manufacturers group, Dr. Rodgers said that "in addition to anti-inflationary pressures of excess capacity, increasing productivity, worldwide weakness in raw material prices, growing unemployment, and increasing credit restraint, the return to limited convertibility in Europe, establishment of the Common Market and completion of the rebuilding boom in the Western World countries will greatly increase both worldwide and domestic competition."

He said "if most industrial countries of the Western World adopt anti-inflationary measures and we continue to follow a policy of creeping inflation, exports will decrease and imports will increase sharply. This will force the U.S.A. to either devalue the dollar or adopt fiscal measures to bring inflation under control. It is of great importance to watch cost and price developments in Europe, Canada, and U.S.A. in the next several months.

"Inflation is not inevitable and in my opinion we will have more sense than to follow on the primrose path of ever cheaper and more dishonest money." If inflationary trends continue, he predicted it might lead to attempts to fix wages and prices.

He expressed great optimism about the business outlook, and said Russia will get what it wants without war. While business is good, he said it is leveling off. He noted that the marriage rate was the lowest in 30 years and less automobiles were sold in 1958 than in 1929 in the U.S.A.

Government spending is out of control, he said, with politicians spending 50 times as much in the same period that national gross products has increased only 11 times.

REPORT FROM PAPER WEEK

NEW MARKET FOR PAPER? At the American Cyanamid Co.'s booth in Commodore Hotel at Paper Week, New York, Broadway and Hollywood glamor girl Celeste Holm models latest fashion: paper hat.

Don't Sell the U.S.S.R. Short

By HAROLD HOLDEN
President, Gilman Paper Corp.

Following are major excerpts from talk which Harold Holden, who is also past president of the Writing Paper Mfrs. Assn., gave at meetings held during the 1959 Paper Week in New York, including the American Pulpwood Assn. Luncheon.

There is no question in my mind but that in the next few years the Russians are going to be formidable competitors in all countries. Obviously, they are going to take care of the satellite countries with their production first, because they have a captive market, but, eventually, they are going to flood other countries with goods at comparatively low prices because there is no profit motive involved; the government sets the selling price, not necessarily in relation to cost, but more on the basis of its propaganda value. Mr. Khrushchev has made the definite statement that he does not want war with us in the military sense, but he is going to war against us industrially and financially, and my observation is that he is doing an excellent job so far, and we had better watch our step.

An illustration of what is happening is that, in Karlstad, Sweden, at the Karlstads Mechanical Works, I saw 16 sulfite digesters that were being built for Russia. Their capacity was 231 cubic meters—they weighed 105 tons, empty—had a ¾ inch stainless steel lining, which is something that we, in the U.S., could hardly afford even with our large production. These digesters were being floated down the canal from Karlstad to Stockholm and were being picked up at Stockholm and towed by Russian tugs across the Baltic, probably to Leningrad. I could not ascertain just where the digesters were going to be located; in fact, there were not too many people in the paper business in Russia who even knew about this order, which is practically completed at Karlstad.

Russia, is automating in all industries to an extent perhaps even greater than we in the U.S. There is some dissatisfaction by those who are earning substantial salaries because they have no way of investing the money in any productive enterprises and because these people would like to get out of the country and travel a little, which, of course, is practically taboo.

However, the people who are working for hourly wages are being treated so much better than they ever have been before that I am afraid it is wishful thinking to believe that there would be any substantial revolt, even if there were an opporunity, which there is not. Any dictator politburo such as U.S.S.R. is, is always vulnerable, but I am very sure that Khrushchev wants to model Russia after the U. S. in every possible way, except, to have the state own everything.

HAROLD HOLDEN; back home from Soviet Russia: "There is no question that in the next few years, Russians are going to be formidable competitors."

Improve on Purchased Equipment

I visited many factories where the equipment was just as old as anything we have in any place in the U.S.A. However, this equipment is being rehabilitated at great speed. I also visited factories where the equipment was just as new as anything we have in the U.S., and it is their idea to buy the most modern equipment that they can find anywhere in the world, order one or two units, and then copy the design. After they order this new equipment, they never permit anybody into Russia to show them how to operate it, not because they are afraid to show it to anyone, but because they change the nature of the design to meet their particular set-up. It also indicates that they know enough about machinery to even improve upon it and that they have the knowledge to do these things without being helped by foreigners.

I saw only two large paper mills, one of them running newsprint and the other making fine paper, but it was really beautiful white clean paper. The newsprint was running around 1600 fpm and the fine paper machine about 800 fpm. While they were perhaps some of the best, I visited a number of box factories and printing plants where they had considerable old machinery, but it had been rebuilt with ball bearings, etc. and, with the latent resourcefulness of the Russian people, they were turning out a very satisfactory product, at good speeds, and, no doubt, at low costs.

Greater Social Security

There is no question but what they have social security to a far greater extent than we do, and it covers agricultural and woods people, just as it covers industrial plants in the larger cities. These people are taken care of from the cradle to the grave by the government, and it is much easier to get into a hospital or a rest home there than it is here, and no one dares to apply unless he is sick. Few people are working more than 40 hours a week and, if they do, they are paid overtime. Their wages per hour are not as low as people might think and with their low housing rent, etc., their cost of living is comparatively low.

Their vacation periods are equal to the most up-to-date that we have in the U.S.A.; in fact, everyone is

BRACKETED BY PRESIDENT OF TOP U.S. PAPER COMPANIES, SAPI President Paul C. Craig tells crowded Sales Association luncheon in Waldorf grand ballroom: "Selling is becoming a profession, not just another job as a peddler . . . we can't just sell markets, we must help create them. We can't just sell accounts . . . we must serve them."

guaranteed at least 30 days vacation a year, and of course, they are guaranteed 52 weeks work a year, although in some instances the employe does not have a choice of where he works but is told where to work, and if work is not available in one city or town, he can be transferred to any part of the country.

Modern Wood Mills

As far as the producing of timber and pulpwood are concerned, I saw some of the most modern sawmills I have ever seen; in fact, they have gone further than we have in reducing the amount of work done in the woods. They bring the whole tree to the sawmill and cut it up and utilize the by-products for fuel, etc., at the sawmill instead of leaving the branches in the woods as we do.

They had the most modern equipment for debarking and sawing that I have seen, even including the U.S.A. operations on the West Coast. The total acreage of accessible forest areas in the U.S.S.R. is slightly higher than in any group of countries, including North and Central America. They have the manpower and the resources to develop these forest regions, and with modern methods of logging and transportation, etc., the U.S.S.R. is bound to be one of the leading producers of timber in the world and, that, of course, in the end means competition in pulpwood and woodpulp and the integrated paper products that naturally follow.

There are plenty of places where they are using obsolete methods the same as we may be doing, but percentage-wise, in the last five years, I think that they have moved ahead faster than we have.

I am positive that within three years, unless we can find some way of putting a tariff on products coming in from the U.S.S.R, we are going to see ruinous competition from that country because, the person who has to sell the product has little or no knowledge of the cost of production, there is no profit motive and they can sell these goods below cost.

They have quality products at the present time, in many instances superior to those in other European countries. Their grades of paper are clean, bright, and their office supply papers are as good as ours; their paper runs well on the presses and on the office duplicating machines, etc.

Views on ILO Problems

The International Labor Organization Conference in Geneva is one of the reasons why I went to Europe. This organization, again, has great potential political difficulties for us. The idea is to improve the standard of living in all of the countries of the world, but, unfortunately, it is competing with the FAO and with many other technical assistance programs which we are sponsoring and subsidizing. The fact that it is tripartite, namely, one employe, one employer and one government man, representing each country, and the fact that the government man and the employe delegate generally vote the same, leaves the employer delegate in a rather difficult position.

After being so well treated in the U.S.S.R., when I got to Geneva I had to take the attitude toward the Russian delegates that we, the employers group, tried and did prove that the Russian employer delegates were, in effect, not employers at all but were part of the government; in fact, the papers read by the employe delegate, the government delegate and the employer delegate from the U.S.S.R. were exactly the same.

We argued that they should certainly be represented at the meetings but that they should not have a vote in any resolutions which might come out because of the fact that they were controlled by the government in all instances.

They of course did not like this but, as vice chairman of the meeting, in my talk I had to explain to them that we could not concur that their employer delegate was a free person. We received support from the employe delegates, namely, the worker delegates from many other countries backing up the U.S.A. in this position.

U.S. Paper Industry Pays Billion Dollars to Railroads

Few, if any, industries rely on the railroads as much as the paper industry—it pays out well over a billion dollars a year for transportation and this does not include hidden freight.

Yet in 1958 the railroads had a bad time—gross income went down to $9.5 billion.

At an open meeting of the APPA, W. L. Thornton, Jr., general traffic manager for Kimberly-Clark Corp., attempted to shed some light on this paradox, if it can be called that.

"Our commodities become valuable only when they reach the place where we want them," he said.

Taking a hard look at the railroads, Mr. Thornton presented some interesting facts: In 1957 the industry produced 30.7 million tons of product with a conservative estimate of a billion, 100 million dollars in transportation costs. A slide rule shows that this amounts to $35.83 per ton—the burden the end product must bear, and this represents a higher burden per ton than the labor cost to produce the product ($30.38 per ton for all grades of paper and board).

It is estimated, said Mr. Thornton, that in 1959 the industry will produce about 32 million tons, which will increase the total amount of freight.

Paper Pays 10% of Railroad Income

It is interesting, too, he said, to note that in 1957 industry sales amounted to 10.42 billion dollars and the freight bill represented in excess of 10% of gross sales. This, he said, represents more than 10% of the gross income of the railroads. In view of this, he added, the industry should take a careful look at the position of the railroads which showed passenger deficits in the east in 1956 of 41.3%; in the west of 45.4% (individual railroads ran as high as 95.5%).

W. L. THORNTON JR., general traffic manager, Kimberly-Clark Corp.: "This industry's freight bill is 10% of its sales. It is also 10% of railroad's gross income."

"As an industry paying over 10% of the gross income of the railroads," he went on, "we cannot afford to stand by and see the railroads' earnings reach such a low level that they must be continually before the Interstate Commerce Commission asking for increased freight rates."

Mr. Thornton called for a better,

more efficient and economical way of handling our transportation business. Savings, he said, could offset some general rate increases and frequently would surpass the amounts saved by a reduction in the freight rates.

"Unjust and unreasonable rates force industry to seek ways and means of avoiding the high cost. This has been done until the railroads now must find other ways to improve their financial position," he said.

"There is considerable feeling today that more might be accomplished through a reduction of transportation charges than by a further attempt to increase them."

The trend? In the direction of agreed charges, multiple car rates, guaranteed rates, lower rates for heavier carloads.

Another way industry might help put the railroads back on a more firm footing, he pointed out, is by supporting legislation which will help them. Last year, for instance, the paper industry supported the roads in a new transportation bill passed by Congress which eliminated the 3% transportation tax on freight.

Mr. Thornton's conclusions were brief and to the point:

1. This industry should not abandon any effort now being made to control the item of transportation expense.

2. It should expand on closer working arrangements between traffic departments and other departments of individual companies.

3. It should lend sympathetic consideration to some of the regulatory problems of the carriers which could tend to improve the overall transportation situation.

Landegger: How To Lick Rising Costs

Nobody is more aware of the rise in costs than the equipment manufacturer—and he must find new ways to "skin inflation."

This was the theme of Black-Clawson Vice President Carl Landegger's talk before the open meeting of the APPA's materials committee. How to do it? Here are some of Mr. Landegger's ideas:

1. Reduction of production costs by use of new methods and machines: Production cost was reduced greatly in one B-C division manufacturing roll coaters through careful pattern design of several components, whereby the need for separate right and left hand castings was eliminated. One pattern now does the job of both.

2. Cordination with suppliers to reduce material costs: Through a series of consulations with suppliers, converting machinery division management found a new cost-saving method of chrome plating and grinding coating rolls.

3. Improvement and expansion of the product line through research and development: A piece of refining machinery which, although costing more this year than it did last, is actually capable of increased capacity and thereby is costing less per ton of production through improved performance.

What are some of the outstanding developments in the industry since World War II? These are a few he listed: Speed-up of Fourdrinier machines from the 1500 fpm range to 2500 fpm and beyond; continuous pulping and economical production of pulp from previously unpractical sources such as small diameter hardwoods; pressure stock screening which has improved formation and dirt removal and is now proving its advantage in hot stock screening in pulp mills; steady development of better coating, impregnating and laminating equipment.

Fibrous Glass Still Not Paper-Practical

More development is needed before the full economic potential of fibrous glass becomes available to the paper industry. So said Dr. Thomas S. Chambers, chemist and consultant to Owens-Corning Fiberglas Corp.

Its brief history, he said, has been marked by intense interest on the part of many paper industry people, by some limited commercial successes and by slow progress toward use on a large scale.

Then, too, there are the problems which must be solved before its prospects can be fully realized. Here are a few which Dr. Chambers listed:

1. Much is still to be learned about the empirical rules of behavior of fibrous glass in blends with groundwood, which differ from those of chemical pulps.

2. Fibrous glass is often not too well bonded in cellulose blends and scuffs from the paper surface. Well-coated sheets do not present this problem. Substantial progress has been made in glass-to-cellulose binding but more progress needs to be made.

3. Fibrous glass sometimes fractures in calendering and sometimes does not. The reasons have still not been fully determined.

4. As is frequently true in the paper industry, laboratory results cannot always be duplicated in the mill. One example: A chemical additive which very neatly counteracts the harmful effects of glass on sheet fold when applied in the laboratory, and fails to do so in the plant.

Lientz

Macdonald

Nethercut

New Top Posts in TAPPI

James R. Lientz, new president of TAPPI, is manager of Savannah, Ga., operations, Union Bag-Camp Corp. Before going to Savannah as supt. several years ago he was manager of Swenson Evaporator's pulp and paper division. Prior to that he had been chemist at Savannah.

Dr. R. G. Macdonald, secretary-treasurer of the organization for many years, has been elevated to the newly created position of assistant to the president. In this capacity Dr. Macdonald will continue as editor of Tappi. In addition he will guide and counsel the president and the headquarters staff in all TAPPI activities for which his experience has well fitted him.

Dr. P. E. Nethercut, formerly assistant secretary of TAPPI and prior to that with Scott Paper Co., has been named secretary-treasurer. In this capacity he will direct activities of the association's staff.

Harold Annis, Oxford Paper Co., is newly elected vice president of TAPPI, in line to succeed Mr. Lientz in 1961.

ED HOPPER, consulting engineer of Pittsburgh, Pa., heads reactivated corrosion committee of TAPPI.

Corrosion Committee Reactivated at Paper Week

Important development of the TAPPI sessions in New York was the reactivation of the TAPPI corrosion committee. The new chairman is Ed Hopper, well known metallurgist and consultant on corrosion matter for the pulp industry, who headquarters in Pittsburgh, Pa.

He and his committee members plan to cover the entire field of corrosion problems from pulp mill digesters to paper machines, throughout the mills, and plan a more complete study than has ever been attempted. Corrosion is costing the industry millions of dollars.

Harry Fritts, of Aluminum Co. of America, is secretary of the committee. The committee was last headed by Steve Baisch, industry consulting engineer of Kaukauna, Wis.

Earl McCourt Reelected

. . . as general chairman of Sulphite Paper Manufacturers Assn., although unable to attend the February meetings due to illness. The membership unanimously joined in a message wishing him a speedy recovery. "Mickey" McCourt, veteran executive of Consolidated Water Power & Paper Co., is an outstanding pioneer in development of major magazine markets for high speed coated papers for this industry and is now in charge of sales for new by-products, paperboard, waxing and tissue paper and woodpulp for Consolidated. Walter C. Shorter, Union Bag-Camp, vice pres., was elected vice chairman.

FERDINAND R. WHITE is new president of Pulp Consumers. He has headed Union Mills Paper Mfg. Co. since 1939.

Pulp Consumer Trends Revealed at Meeting

Market woodpulp production for U.S.A. mills is now split three ways, according to the report at the annual luncheon of the Association of Pulp Consumers Inc., which again was a highlight of Paper Week in New York:

40% from Canada.
48% from U.S.A.
12% from Scandinavia and other sources.

This was the message of retiring president, Don Driscoll, who heads Sorg Paper Co. He turned over the presidency of the association to Ferdinand Roebling White, 51-year-old president of Union Mills Paper Mfg. Co., of scenic and colorful New Hope, Pa., a mill making 20 tons a day of electrical insulating and other specialty papers. Mr. White, successor to his father in a family paper business, lives in nearby Princeton, N.J., and has headed the company since 1939, except for wartime service in the U.S. Quartermasters Corps as a paper procurement officer.

The consumers and their guests, the pulp producers, heard that Canada's share of U.S. market pulp is continually increasing. Jack Kimberly, president of APPA, Robert M. Fowler, president of CPPA, and William B. McGoldrick, president of the Assn. of American Wood Pulp Importers, spoke for the U.S.A., Canadian and European market pulp producers, respectively. The first two, who have had several opportunities to air their views on industry outlook, decided to let their words stand—while Mr. McGoldrick spoke briefly of the outlook for overseas U.S.A. imports. He said "we look for continued improvement of general conditions in the U.S.A. market" and observed there was a good market for the special purpose pulps from Europe.

As has become a Paper Week tradition, Reed Porter, the Consumers secretary-treasurer, came up again with an outstanding speaker—Gen. Donald N. Yates, commander, U.S. Air Force missile test center, Cape Canaveral, Florida, who is also credited with picking World War II's D-Day and flying the first scheduled weather reconnaisance mission over the North Pole. He told of the careful and complicated tests of missile components, with sensational color films to illustrate his talk.

He said what the press has called missile failures or even catastrophes have in many cases been up to 95% successful. He described the 12 "down range" missile stations and their equipment, extending for thousands of miles southeast from Florida to mid-Atlantic islands between Brazil and Africa. Also the 11 ocean vessels and some 40 aircraft used in observation and support. Some $470,000,000 is invested in these "plants" alone and $130,000,000 is their annual operating costs.

Association Leaders for 1959

American Paper & Pulp Assn.—JOHN R. KIMBERLY, Kimberly-Clark Corp.
TAPPI—JAMES R. LIENTZ, Union Bag-Camp Paper Corp.
American Pulpwood—GEORGE B. AMIDON, Minnesota & Ontario Paper Co.
Pulp Consumers—F.R. WHITE, Union Paper Mfg. Co.
Pulp Producers—JAMES L. RITCHIE
SAPI—JOSEPH E. HOFFMAN, Standard Paper Mfg. Co.
Stream Improvement—GEORGE E. DYKE, Continental Can Co.
Sulphite Paper Mfrs.—EARL M. MCCOURT, Consolidated Water Power & Paper Co.
Writing Paper Mfrs.—ARTHUR CRANE, Crane & Co., Inc.
Bristol Board Group, Writing Paper Mfrs. Assn.—G.H. CARLTON, Standard Paper Mfg. Co.
Newsprint Service Bureau—M.C. MCDONald, Great Northern Paper Co.
Kraft Paper Assn.—S.D. FLEET, Albemarle Paper Mfg. Co.
Paper Napkin—J. F. MEYER, Hoffmaster-Pacific Co.
Glassine & Greaseproof—FREDERICK S. LEINBACH, Riegel Paper Corp.
Tissue—ROBERT YOUNG, Waterfalls Tissue Co.
Specialty Paper and Board—DAVID C. KNOWLTON, Knowlton Bros.
Printing Papers Mfrs. Assn.—W.H. WILCOX, S.D. WARREN.
Absorbent Paper Mfrs. Assn.—ROY A. NASH, Sorg Paper Co.
Paper Bag Institute—SIDNEY K. BRADLEY, Union Bag-Camp Paper Corp.
Soda Pulp Mfrs. Assn.—E. H. CLAPP, Penobscot Chemical Fibre Co.

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a candy bar or a wonder drug

Clinton Products go into the making of many good things. Yours?

It has been said, "Wherever you may be and whatever you touch, one or more products of corn enter into its manufacture." The fabric from which your shirt is made was woven with the aid of starch. Starch gave it the fine finish at the laundry. The cigarette you smoke, the magazine you read, the food you eat, the beverage you drink—yes, the candy with which you treat your youngster or the antibiotic in your doctor's prescription depended in some way on a product that was made from corn.

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Clinton starches and dextrins will always meet your most exacting specifications. Consult your Clinton salesman. He will provide product information, arrange for prompt technical service, or assist you in any way possible.

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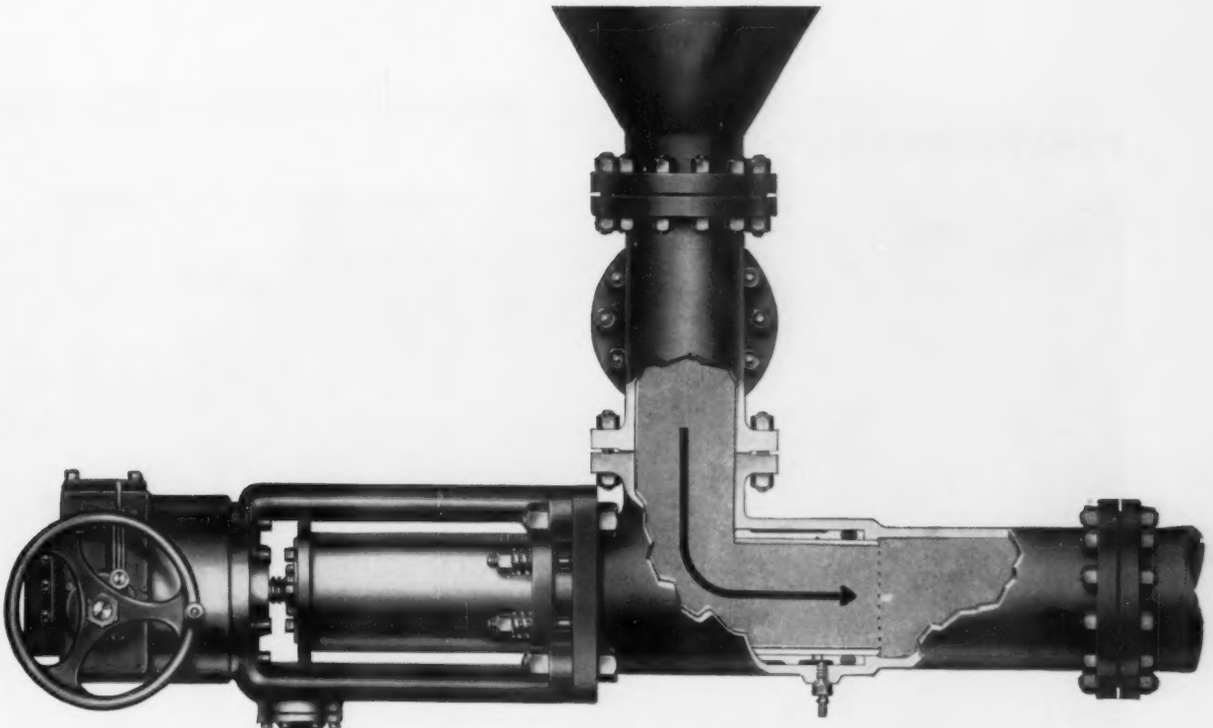
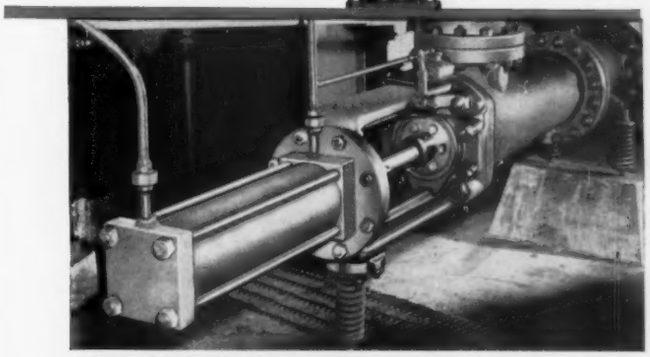
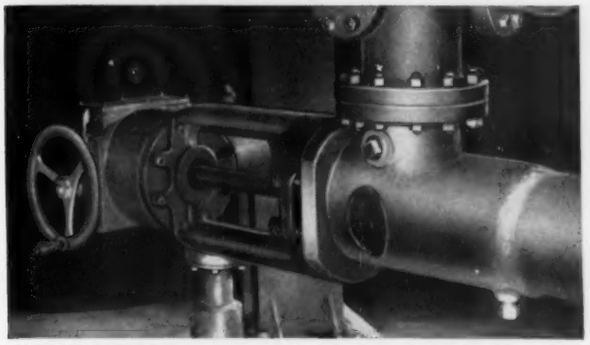




HYDRAULIC-OPERATED Yarway Digester Blow Valve—one of six installed at large North Carolina paper mill.



MOTOR-OPERATED Yarway Digester Blow Valve—one of eight installed at large Canadian paper mill.

full, free digester discharge

Digesters blow fast and clean with YARWAY Seatless Blow Valves.

The hollow sliding plunger has no pockets where wood chips or tramp materials can hang up.

All Yarway Digester Valves have full pipe area, permitting fast discharge with minimum pressure drop. Comparisons show greater discharge area—reducing blowing time, increasing number of cooks.

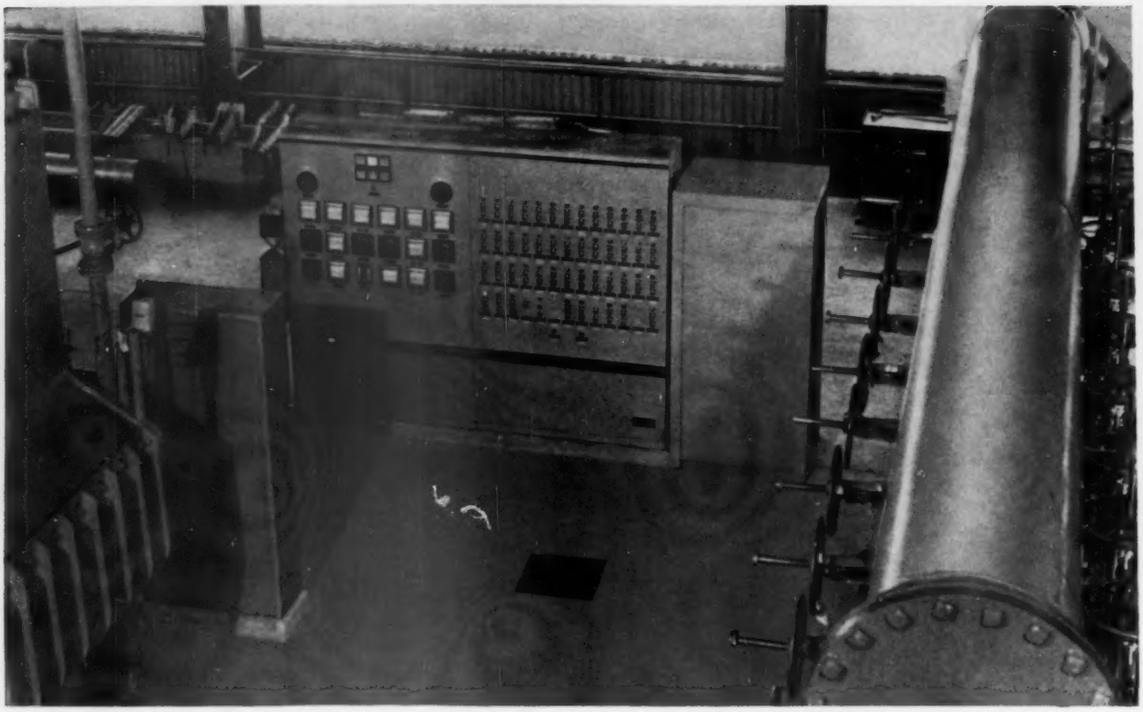
Scores of pulp mills report *lower operating costs* and *increased production* due to YARWAY Digester Blow Valves. One large mill found *savings in operation and maintenance the first year more than paid the cost of their 4 new Digester Valves!*

YARWAY Seatless Digester Valves can be furnished either with electric motor or hydraulic cylinder units. Both are remote controlled. Bulletin B-441 gives the whole story. Write for it.

YARNALL-WARING COMPANY
103 Mermaid Avenue, Philadelphia 19, Pa.
BRANCH OFFICES IN PRINCIPAL CITIES

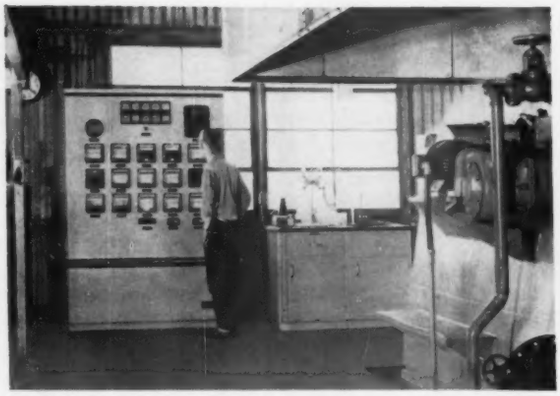
YARWAY · · · **DIGESTER BLOW VALVES**

PHOTO REPORT:

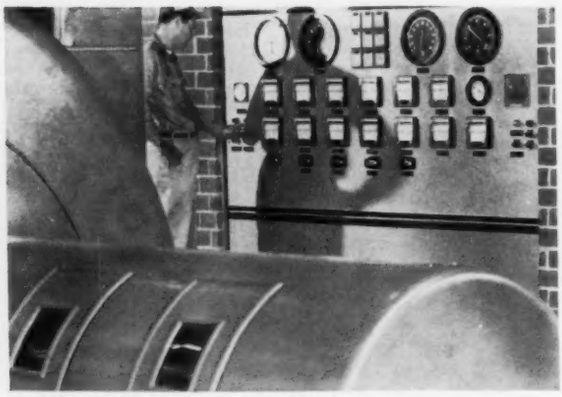


PULP MACHINE — WET END Control panel for wet end of pulp machine seen from upper mezzanine. At right are push buttons used for remote operation of all electrical equipment. On pipe standard at left, Foxboro d/p Cell Transmitter** senses level in machine head box.

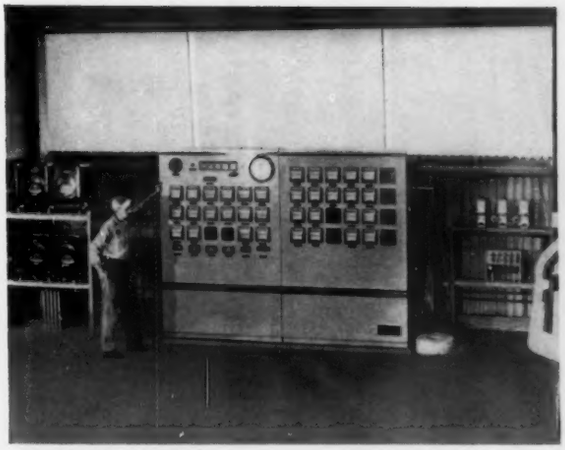
NEW CONTINUOUS PULP MILL OF GULF STATES PAPER CORP.



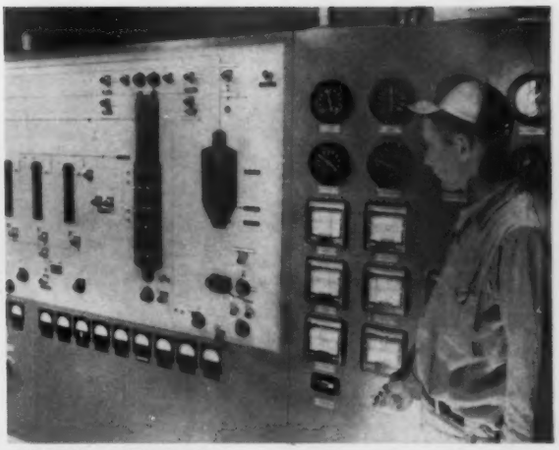
BROWN STOCK WASHERS Foxboro Consotrol Control Panel for three-stage Brown Stock Washers includes foam tank level and Save-all controls. Conductivity measurement of weak filtrate is basis for automatic regulation of shower flow to third stage washer.



TURBINE ROOM Foxboro Control Center for steam pressure reducing stations in background, with generator in foreground. Steam flows, pressures, and temperatures are recorded and controlled — steam flows totalized.



BLEACH PLANT Main control cabinet for five-stage bleach plant is typical example of how complete instrumentation with space-saving Foxboro Consotrol receivers results in convenient size panel. Operating consoles (not shown) are provided at the washers for control of speed, stock rates, and dilution flow.



KAMYR DIGESTER Continuous digester control panel features graphic representation of 300 T/D Kamyr digester system, blow tank included. Integral with the graphic section are push button and switch controls which provide complete remote operation for all pumps, feeders, and valves.

COMPLETELY INSTRUMENTED by Foxboro from variable to valve — that's the automation story at Gulf States Paper Corporation's new $25 million bleached pulp mill at Demopolis, Alabama.

More than 25 types of Foxboro instruments are used to measure, transmit, record and control over a dozen different variables. Variables that include: temperature, temperature difference, pressure, pressure difference, liquid level, conductivity, flow, motor load, speed, density, oxidation-reduction potential, pH, dew point, and moisture.

When designing their new mill, Gulf States standardized on Foxboro pneumatic Consotrol* instruments. Major reasons: 1) Foxboro's demonstrated ability and experience in the pulp and paper industry; 2) compact Foxboro panels reduced the size of their control centers and hence, helped keep building costs down.

Gulf States' plant represents one of the most completely automatic pulp mills in the industry today. Automation based on Foxboro's application-engineering know-how. If you're planning an expansion or modernization program, you can put this experience to work for you. Call your local Foxboro Field Engineer, or write **The Foxboro Company, 994 Neponset Ave., Foxboro, Mass.**

*Reg. U. S. Pat. Off. **Trade Mark

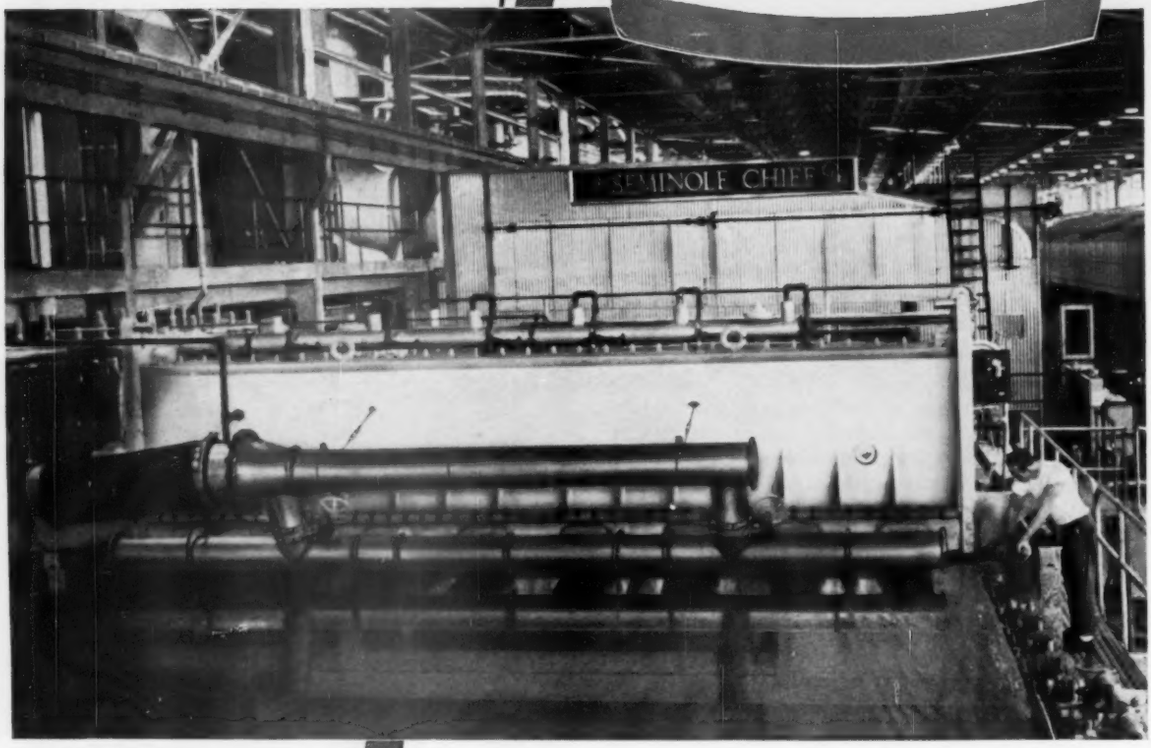
BLACK LIQUOR EVAPORATORS Foxboro Control Panel for black liquor evaporators also includes recording and control stations for the causticizing area. Foxboro Dynalog* electronic indicators transmit pneumatic signals of flow, temperature and conductivity to the appropriate recorders and controllers.

FOXBORO REG. U.S. PAT. OFF. **INSTRUMENTATION**

for the Pulp and Paper Industry

Another
pressure secondary headbox by....

VALLEY



On..... St. Regis Paper Company's new giant paper machine at Jacksonville, Florida.

VALLEY IRON WORKS CO., APPLETON, WISCONSIN

A "Special Detergent" for continuous washing of pickup felts

IGEPAL® CO-630

is economical, easy to apply... lengthens felt life

Because of its truly nonionic nature, Igepal CO-630 does not form insoluble precipitates with calcium and magnesium, as does soap, or anionic based detergents. This nonionic detergent is compatible with alkaline salts, acids and commonly used solvents, but contains no harmful alkalis to weaken felt.

Paper machine wet-end felts can be washed with Igepal CO-630 solutions in the usual felt conditioning units, either continuously or intermittently while running; there is a minimum of foaming action. Igepal improves drainage, is positively non-shrinking. Complete technical information supplied on request. Simply write—

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Portland, Ore. • San Francisco • Los Angeles. IN CANADA: Chemical Developments of Canada, Ltd., Montreal

Igepal CO-630, manufactured by General Aniline & Film Corp., is sold outside the United States and Canada under the tradename Antarox CO-630 by distributors all over the world.

COOPER ALLOY VALVE BRIEFS

THE VALVE AND FITTINGS ANSWER CORNER

Send in your questions on stainless valves and fittings to Carl Tylka, Cooper Alloy Technical Service Director.

Q. *What is meant by "ferroxyl quality" in evaluation of a stainless casting?*

A. This means a superior surface quality free from pinholes, porosity, scale particles, iron film, grease, or other undesirable conditions, as is guaranteed by passing the ferroxyl test.

Q. *Will stainless steel of the 18-8 type corrode in a moist atmosphere?*

A. Not ordinarily, but it will in contact with graphite.

Q. *Can the use of stainless materials having different hardnesses be effective in preventing galling?*

A. Yes, providing the hardness differential amounts to 50 Brinell or more. Corrosion resistance of the hardened material is generally lowered, however, and trouble may ensue in severe service. Use of V2B alloy as the hardened medium will prevent galling and provide sufficient corrosion resistance.

Q. *Is 18-8s MO (316) better than 18-8s (304) for use in hot strong nitric acid?*

A. No, in this particular case 304 is better than 316.

Q. *Why is it that steel is resistant to 70% sulfuric acid, while stainless 304 is not?*

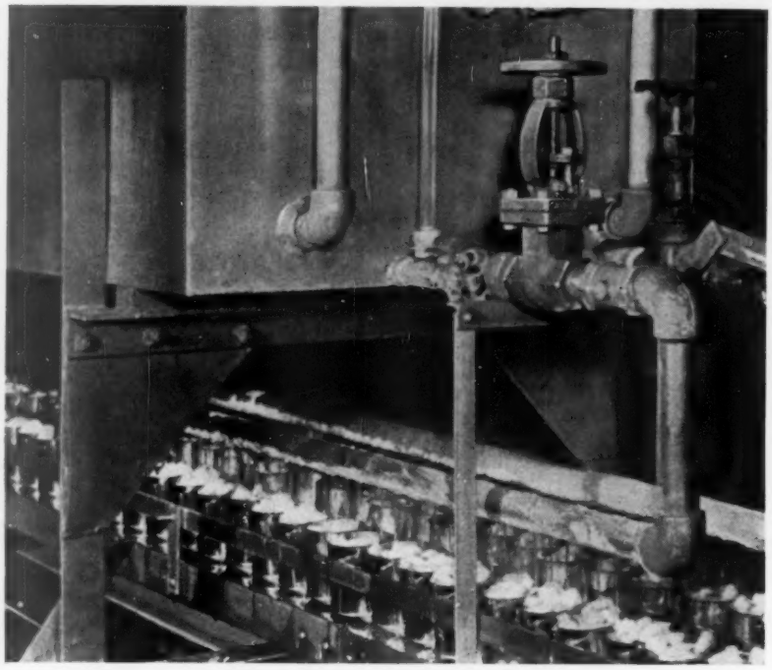
A. Because sulfuric acid forms an iron sulfate film on carbon steel which is insoluble in sulfuric acid of over 65% concentration, thus protecting the steel from further corrosion. This particular film does not form on stainless, which depends upon passivity for corrosion resistance. In 70% sulfuric acid passivity is lost and the stainless corrodes.

Q. *Is 316 alloy better than 304 for handling hot caustic solutions?*

A. No, 316 has no better resistance than 304 and FA-20. That is why Monel is recommended. In extremely severe cases use pure nickel.

Q. *What can I use where 316 is necessary for corrosion resistance, but fails through lack of resistance to accompanying abrasion or erosion?*

A. Cooper PH-55A alloy resists all corrosive media that can be handled by 316 (except very hot and strong nitric acid), and in addition is resistant to both abrasion and erosion.



How the Cooper Alloy Valve became a Giant—among Shrimps!

Cooper Alloy Valve Handles Hot Brine at Shrimp Canning Plant for Twelve Years Without Maintenance

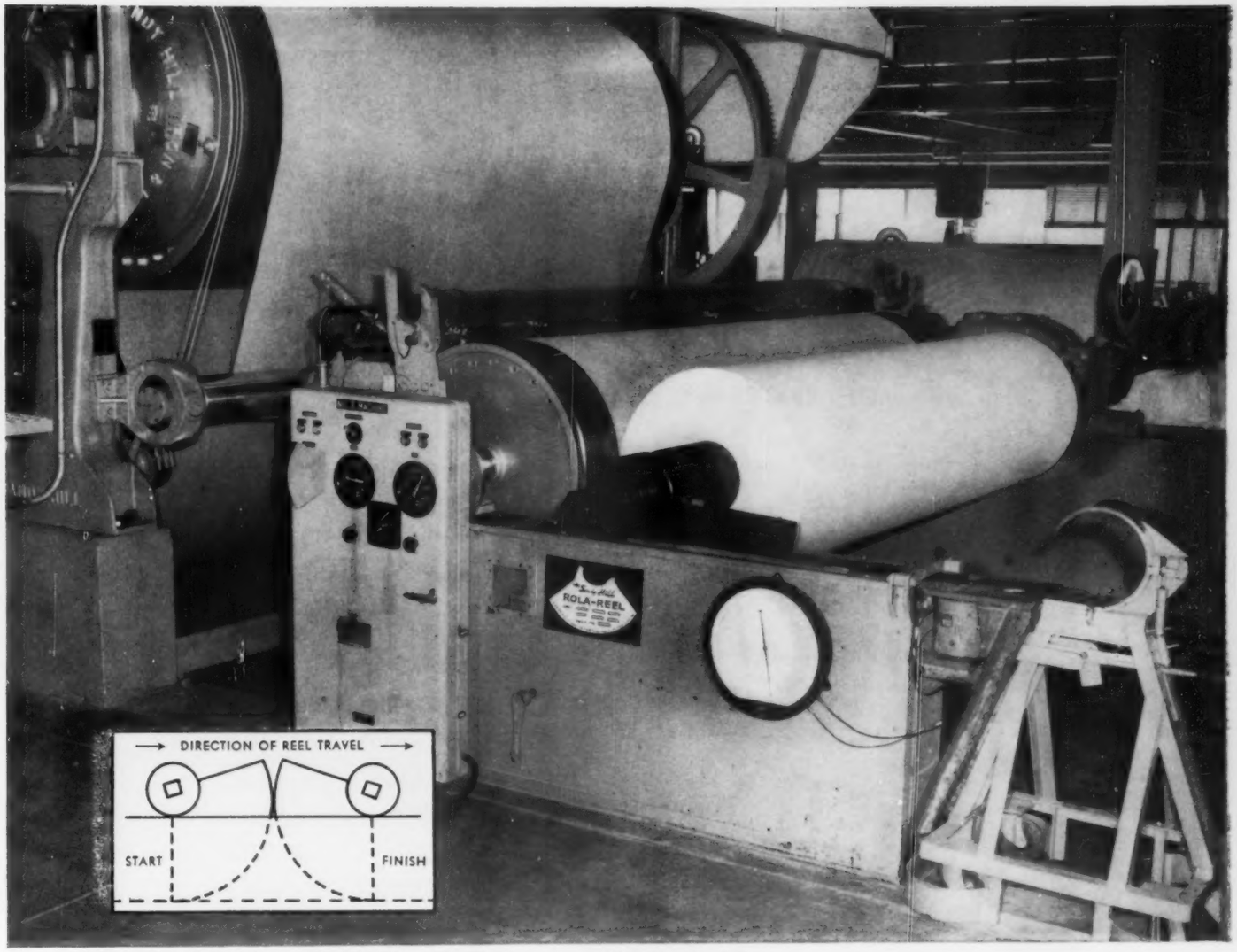
It's not often that we get a chance to put a title as catchy as this on our valve success stories, but this story really rates it!

It all happened at the Robinson Canning Company in New Orleans, one of the world's largest canners of shrimp. They can as much as 100,000 lbs. of shrimp a day—three cans a second! And here's the problem: to the shrimp in each of these cans hot brine solution (180°F.) is added as a preservative—to the shrimps, that is, because brine is mightily corrosive to most valve materials.

The master control valve for this gravity-feed brine-filling operation used to be a brass gate valve, but it couldn't stand the corrosion gaff. So, 12 years ago the Robinson people replaced it with a Cooper Alloy 1-in. Monel gate valve. (Vital statistics: OS&Y, 150-lb. service, bolted bonnet, screwed ends.)

And during the ensuing 12-year period, this Cooper Alloy valve has handled 2500 gallons of hot brine per day—without maintenance of any kind! Only very recently did it become necessary to replace a few non-Monel parts, such as handwheel, packing flange, and eyebolts.

As we said at the start of the story, that's a performance record that's a giant in any man's process! For more information on Cooper Alloy valves and their performance capabilities, write to Cooper Alloy Corporation, Hillside, N. J.



A BRAND NEW REEL CONCEPT . . .

THE SANDY HILL Rola-Reel

Sensationally new and far ahead of the parade, the Sandy Hill **Rola-Reel** already is building a record of proven performance.

Customers acclaim the substantial reduction in paper loss at the reel, and also the improved firmness and evenness of winding.

The unique quadrant reel carriage reduces friction by substituting rolling for sliding motion, resulting in a new accuracy in control of nip pressures.

Finished reel automatically discharges to back of the reel stand, the carriage immediately returning to receive new spool. The finished roll of paper may be rolled directly onto skid or unwinding stand, thus requiring no crane.

Dial indicator showing reel diameter, a weighing device giving roll weight right at the reel, and a panel for fingertip control of reeling are optional equipment. Sandy Hill also builds lightweight reels, **Pope-type** constant speed reels, and the **Dualode** for heavy duty pulp service.

WRITE FOR DESCRIPTIVE BOOKLET AND COMPLETE TECHNICAL DETAILS

THE
SANDY HILL
IRON AND BRASS WORKS
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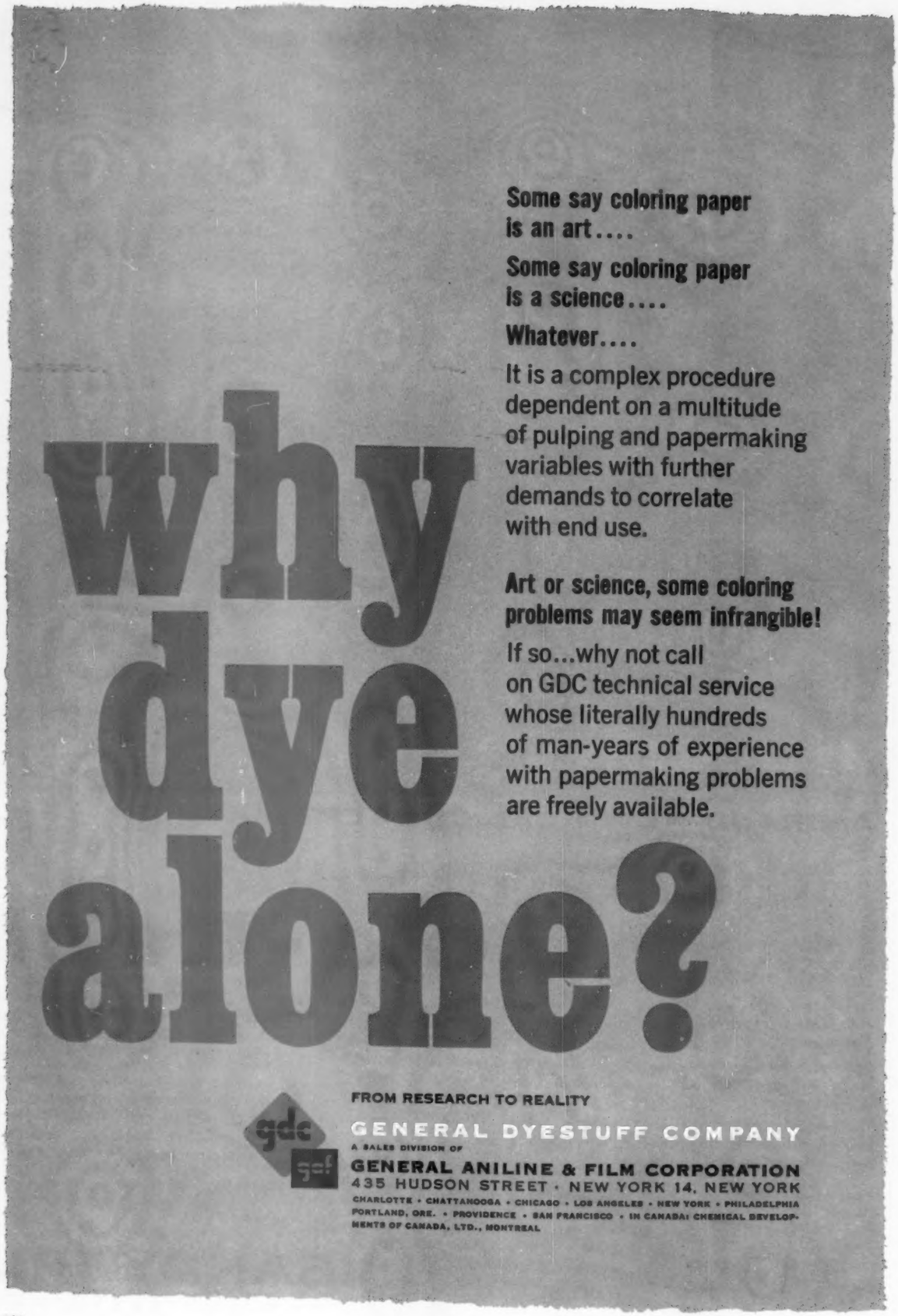
Some say coloring paper is an art....
Some say coloring paper is a science....
Whatever....
It is a complex procedure dependent on a multitude of pulping and papermaking variables with further demands to correlate with end use.
why dye alone?
Art or science, some coloring problems may seem infrangible!
If so...why not call on GDC technical service whose literally hundreds of man-years of experience with papermaking problems are freely available.
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Why Insul-Mastic costs less than ordinary asphalt coatings . . .

THERE are several ways to measure the cost of a protective coating. But the only *true* way is by measuring its *performance*. And performance is determined largely by the materials that go into a coating.

Insul-Mastic is sometimes considered an asphalt-type coating. But, unlike ordinary asphalt coatings, Insul-Mastic contains special materials which resist corrosion and wear far longer and better than straight asphalt coatings.

These materials include:

1. ***Large Amounts of Gilsonite*—the natural resin that is virtually *unaffected* by moisture, acids and alkalis.**
2. ***Mica Flakes*—highly resistant to weather, wear and sun's rays.**
3. ***Asbestos Fibers*—used as binders to provide greater toughness and resistance to wear.**

Obviously, Insul-Mastic costs a few cents more than common asphalt coatings. But, when you measure its cost in terms of *far greater service life* (10 to 20 years is not uncommon), Insul-Mastic *always* proves to be your most economical investment!

Still another important Insul-Mastic *plus* is the technical field service which is available whenever you need application assistance. *Call your Pitt Chem Distributor for full information about Insul-Mastic coatings, today!*

Think First of the Coatings that Last!

PITT CHEM "Insul-Mastic"® Gilsonite-Asphalt Coatings

PITT CHEM "Tarmastic"® Coal Tar Coatings

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PITT CHEM Industrial Coatings are available through leading Industrial Distributors. See the "Yellow Pages."

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Smears of size on glass show clarity of Ten-O-Film, right, almost invisible, compared with conventional starch, left.

Sure way to CLEAR, UNIFORM COATING

The highest degree of coating quality can be achieved with the new, improved Ten-O-Film starches.

These new starches possess unexcelled clarity, uniformity and film-forming properties. They are available in a series of fluidities to meet your exact requirements. Because of their high degree of viscosity stability at high solids, Ten-O-Film starches reduce setback and maintain adhesive strength, assure good performance. At lower concentrations Ten-O-Film starches assure superb structural film continuity and excellent results.

For technical assistance in selecting the TEN-O-FILM starch best suited to your needs contact our nearest sales office or write direct.

TEN-O-FILM® starches

Fine products for the Paper Industry: EAGLE® • FOXHEAD® • GLOBE® • TEN-O-FILM® and CLARO® starches. GLOBE® dextrines and gums.

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Longer Life
Faster Drying

SCAPA Synthetic Reinforced* Cotton Dryer Felt

Type #1164-S and #1166-S

Running up to double life of competitive cotton felts—outrunning asbestos felts in many cases—bringing the advantage of faster drying found only in cotton felts.

Scapa staggered-butt clipper seam using synthetic tapered webbing is engineered to give the extra life required from these longer running Scapa felts.

Prompt, dependable shipments from our new mill at Waycross, Georgia, including all widths from the smallest felt through the widest felts in the country.

*U.S. Patent Application Serial No. 524410

Can be furnished with our famous GREEN DACRON EDGE when desired (U. S. PATENT 2,612,190). These reinforced edges of pure, spun Dacron will outwear the felt, under the most severe conditions.

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309 SOUTH STREET, FITCHBURG, MASSACHUSETTS
Sole U. S. Agents for

SCAPA DRYERS, INC.
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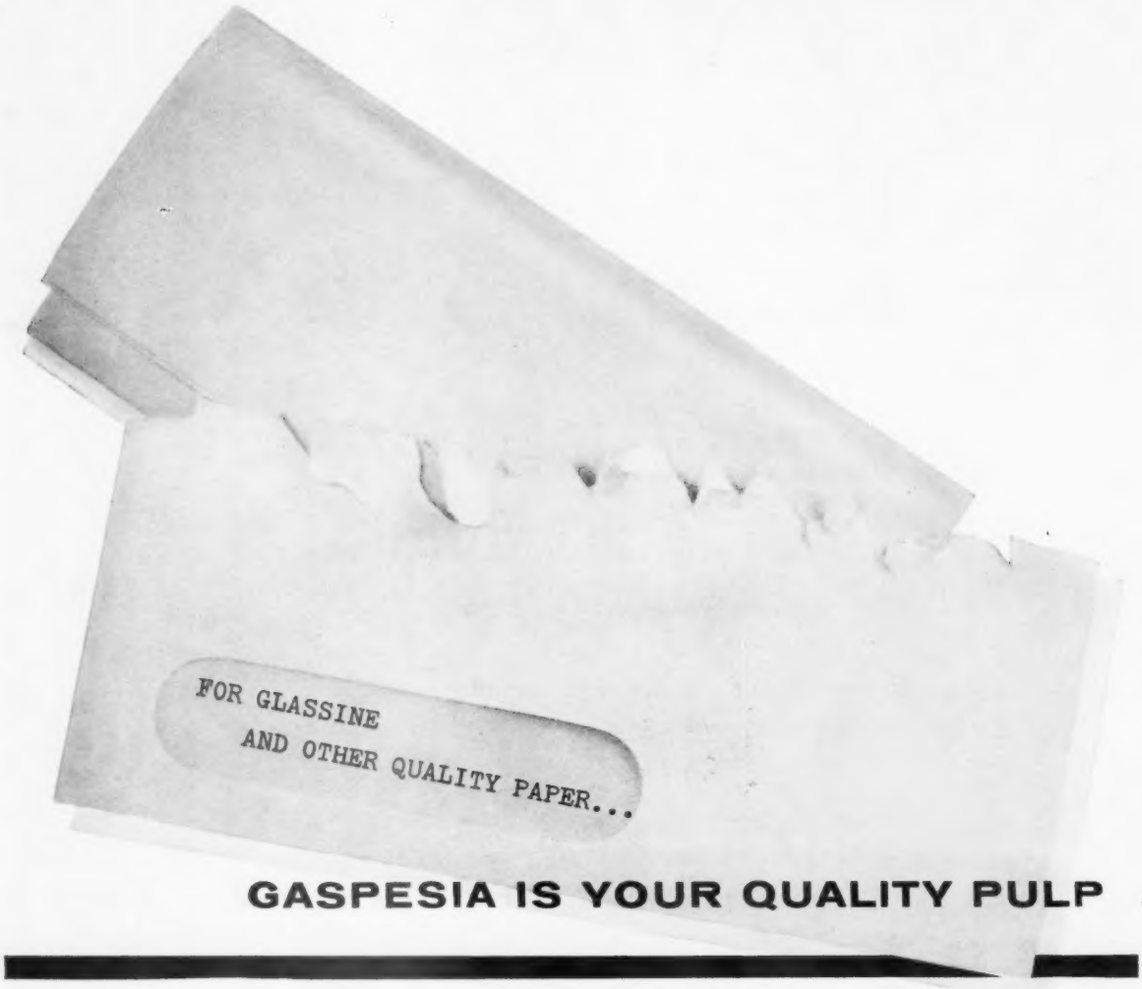

GASPESIA IS YOUR QUALITY PULP

Did you know that Gaspesia makes pulp for letterhead and envelope stock as well as glassine windows?

For envelopes and letterheads, *Gaspesia Standard* is your quality pulp. For quality windows or any other glassine use, it's *Gaspesia Glassine*. Make Gaspesia the sole source for your sulphite requirements.

Location on the Gaspé Coast, within easy reach of waterways to the whole world, affords low-cost water transportation to every market. Shipping time to Europe is about half that from the Pacific Coast. Transcontinental rail systems speedily deliver carload quantities to United States and Canadian markets.

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THE FIRST AND ONLY ALL-PURPOSE
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MARKET PULP

HUY-5 gives felts outstanding resistance to...

- **wear**
- **bacterial and chemical attack**
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For the full story of the ways HUY-5 contributes to increase production... improve product quality and lower felt cost, talk to the Huyck Sales or Field Service Engineer who visits your mill.

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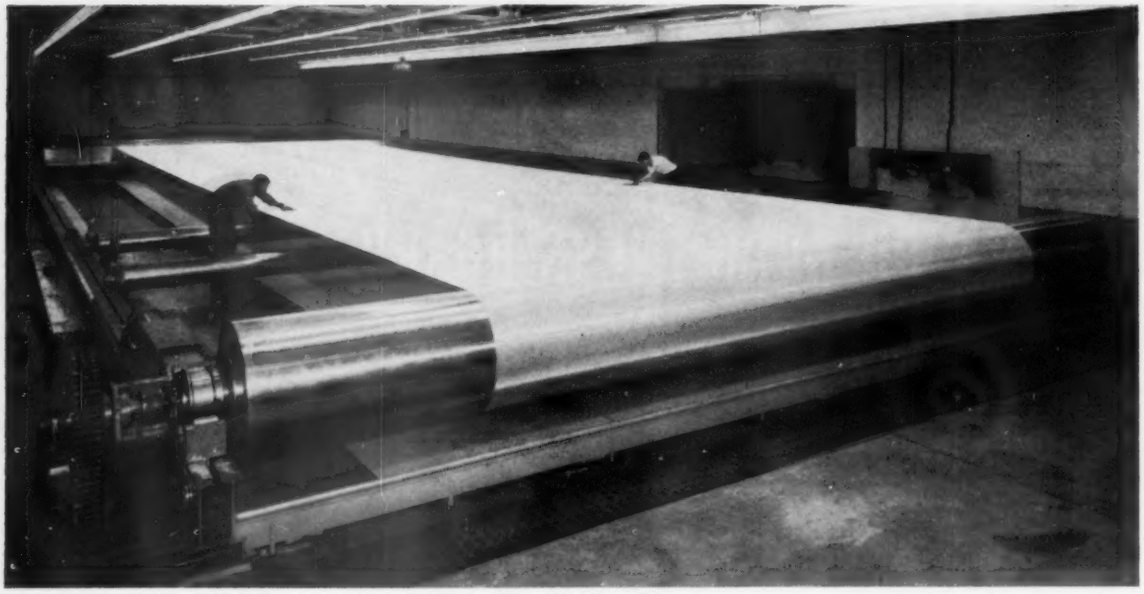
On this giant finishing table (one of seven), capable of finishing wires up to 410 inches in width, Appleton wires are carefully conformed, thoroughly inspected. All the wires we weave—from under 50 inch widths to over 300 inch mammoths—receive the same painstaking attention. It's part of our rigid quality control program . . . and another reason why Appleton wires are good wires.



Appleton's Fourdrinier wire pioneering is exemplified by our tin coated wires for corrosion resistance, and Mangaloy wires for greater resistance to abrasion. Ask your Appleton Wire Works representative for details. Appleton Wire Works, Inc. General Offices, Appleton, Wisconsin. Plants at Appleton and Montgomery, Alabama. International Wire Works, Menasha, Wisconsin, an affiliated company.

APPLETON WIRES ARE GOOD WIRES

How

RYKON

GREASE

has performed in seven tough applications

In just two years since introduction, **RYKON** Grease has stepped in to deliver lubrication in hundreds of applications where other greases have failed

1

2

3

4

In the process industries where higher speeds, loads, temperatures and pressures are being put on bearings as a means of increasing productivity of equipment, a new type of grease has been needed. RYKON is that grease. Here are just seven examples of how RYKON Grease has performed in tough spots:

Industry	Equipment	Type of Bearings	Conditions	Remarks
Packing Company	can closers	various	high temperature, heavy load, wet	Outperforms previously used greases.
Brewery	washers, conveyors	various	high temperature, wet	Lasts longer and does a far better job on all applications.
Packing Company	canning machines	plain and anti-friction	wet	Very satisfactory.
Chemical Laboratory	washers and degreasers	anti-friction	wet	Better than any grease tested in degreasing solvent.
Automotive Parts Mfr.	reciprocating pump bearings	plain	wet	Pumping chemicals. O.K. after one month. Previous grease caused about one bearing failure per week.
Paper Mfr.	liquid sulfur pump	anti-friction	high temperature, wet	Has extended life of bearings.
Paper Carton Mfr.	all grease-lubricated parts	various	high temperature, heavy load, wet	Replaced eight different greases. Stays in better.

The reason RYKON Grease can perform under conditions that cause other greases to fail is this: RYKON Grease has a unique non-soap, organic thickener. This thickener holds the oil between its fibers better than any other gelling agent. The thickener is able to withstand extremely high as well as low temperatures. It resists chemical action and remains stable under conditions of severe working and water washing. RYKON Grease has exceptional anti-rust properties.

RYKON Grease's unique properties make it truly multi-purpose. This leads to many worthwhile economies. With one grease to do possibly every grease lubrication job in a plant, there's no chance for application mistakes. Inventory and handling of many single-purpose greases is reduced or eliminated and maintenance training and supervisory follow-up is greatly reduced.

More facts about RYKON Grease are yours for the asking. Call the lubrication specialist in your nearby Standard Oil office in any of the 15 Midwest and Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 S. Michigan Ave., Chicago 80, Illinois.**

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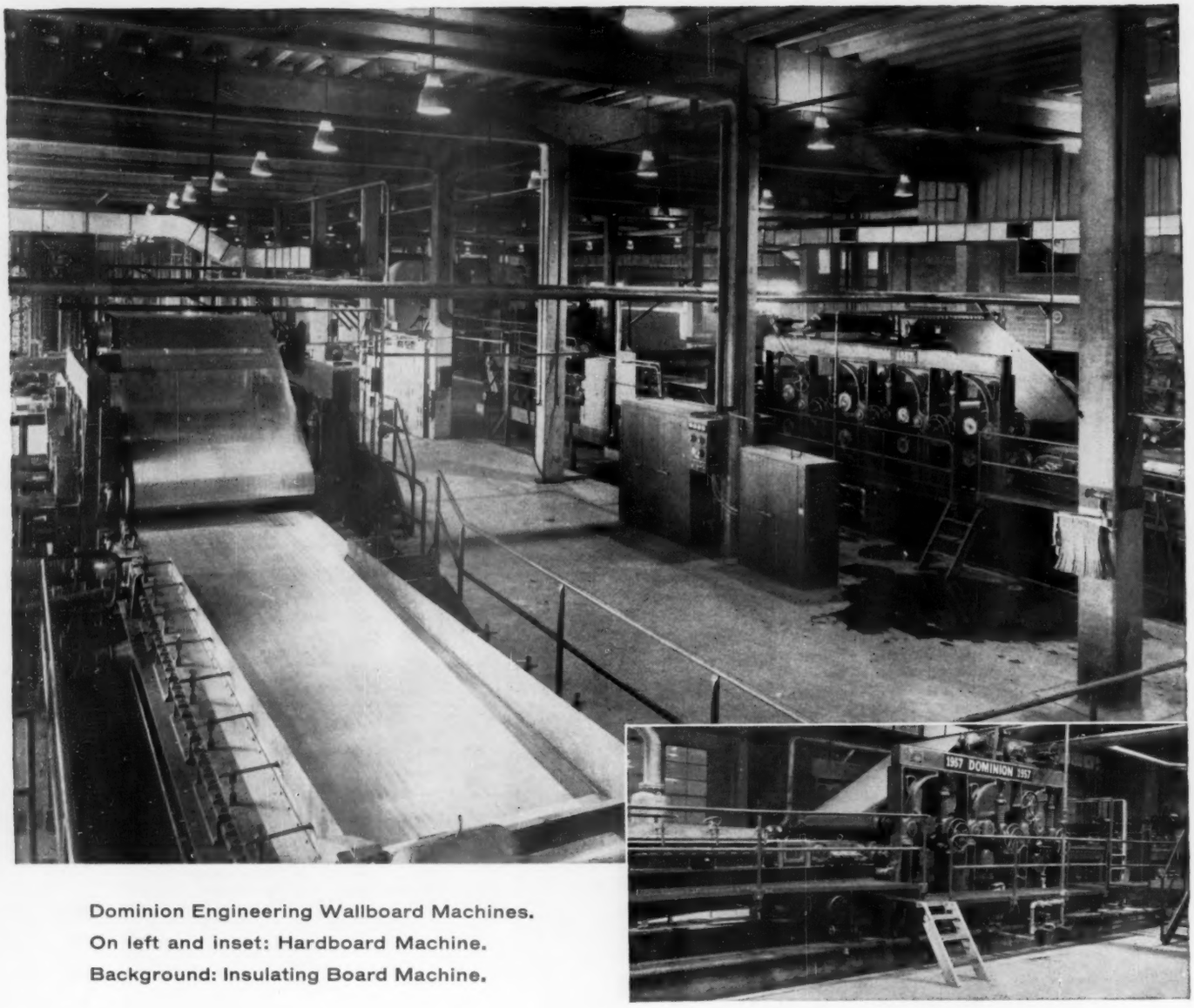
Oven test shows high temperature performance of RYKON Grease. **1.** Metal panel coated with RYKON and placed in oven at 350° F. **2.** Same panel after five days. RYKON is still soft and ready to lubricate. **3.** Another high-melt grease ready for same test. **4.** Same panel after oven test. Grease has failed completely.



Dominion Engineering Wallboard Machines.
On left and inset: Hardboard Machine.
Background: Insulating Board Machine.

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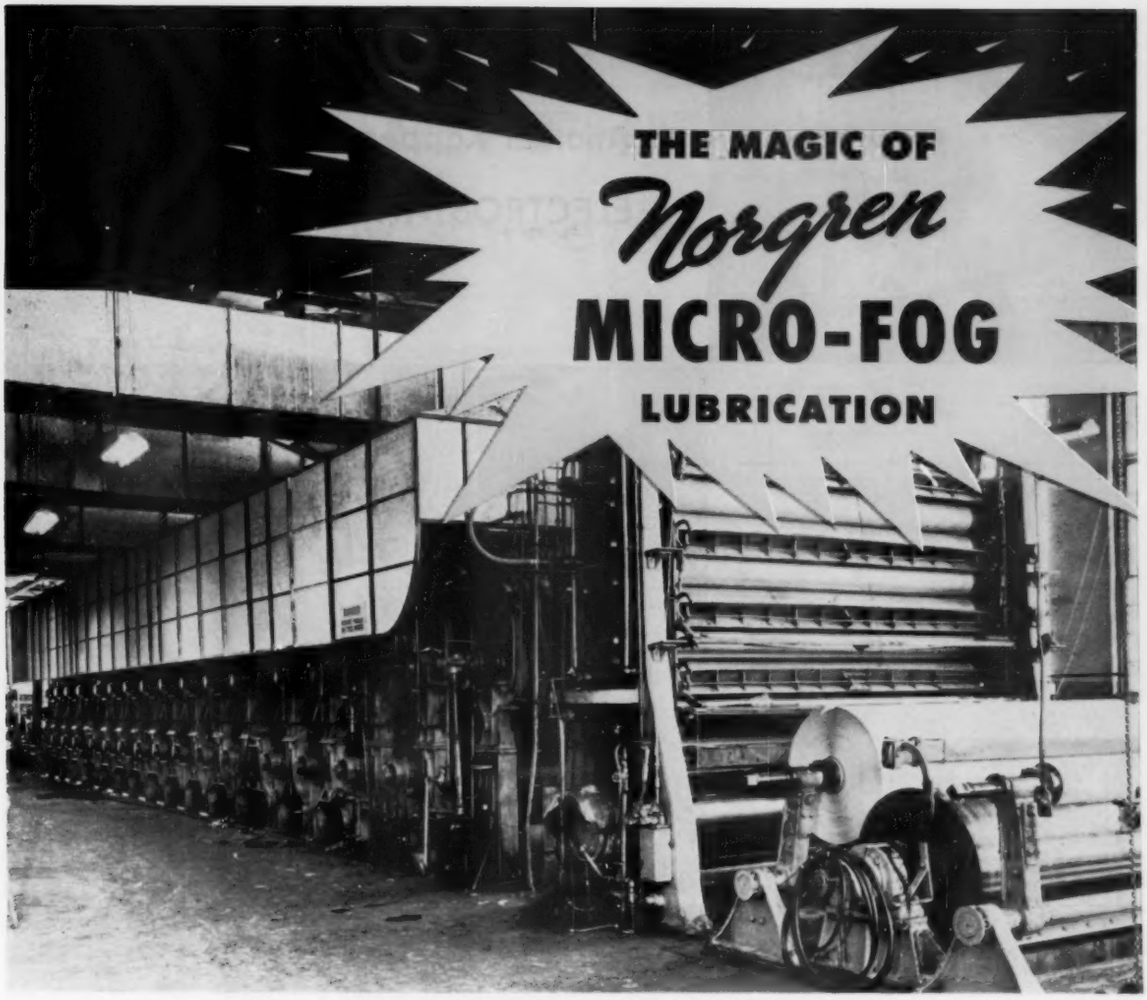

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Automatic, centralized Micro-Fog Lubrication was installed early in 1957 by Gould Paper Co., Lyons Falls, N. Y., on the dryer section of this paper machine. It has lowered the average operating temperature of all 86 half bearings (9½" dia. x 12") from 189° F to 139° F. Two other similar machines were also converted by this company to Micro-Fog — a total of 368 bearings of all types.

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2. Elimination of the cost of hand oiling and block grease replacement.
3. Elimination of fire hazard from dripping lubricant.
4. No product contamination.
5. 66% reduction of lubricant consumption.
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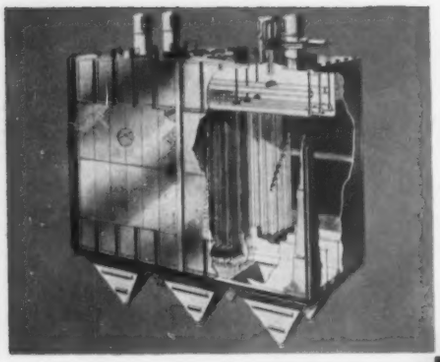
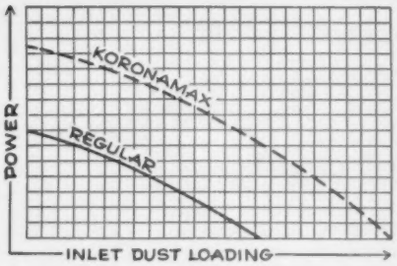
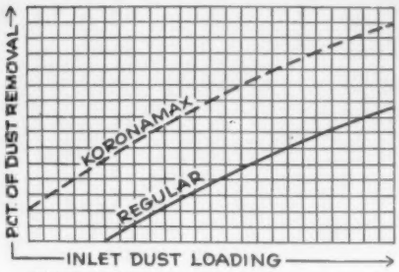


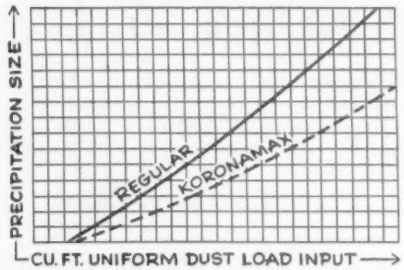
Another Koppers Exclusive in ELECTROSTATIC PRECIPITATION



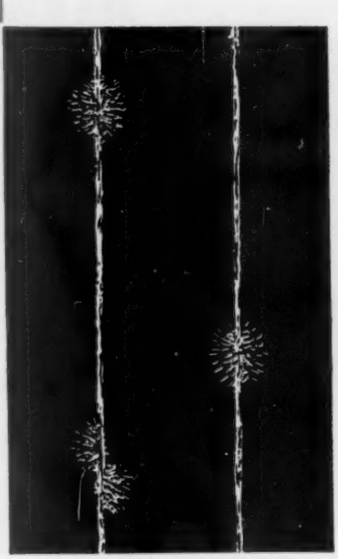
INCREASED POWER—The evenly spaced discharge points of "Koronamax" Electrodes reduce the arc-over tendency and permit increasing power input.



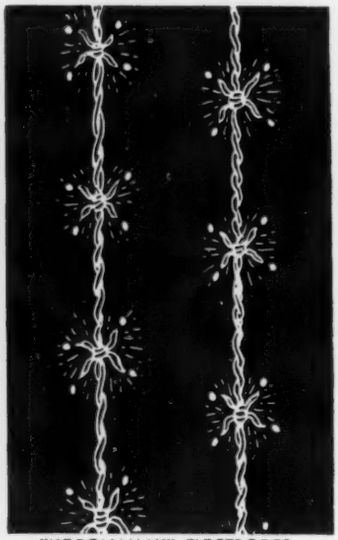
HIGHER EFFICIENCY—Replacement of regular electrodes with "Koronamax" Electrodes allows higher power input — greatly increased efficiency.



SMALLER SIZE—In new installations desired efficiency may be obtained with smaller unit when "Koronamax" Electrodes are used.



CONVENTIONAL ELECTRODES



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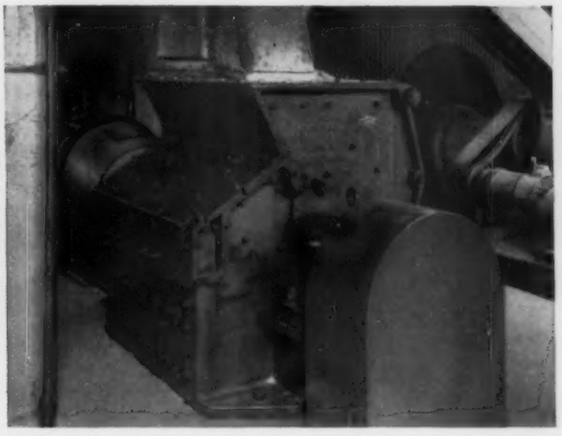

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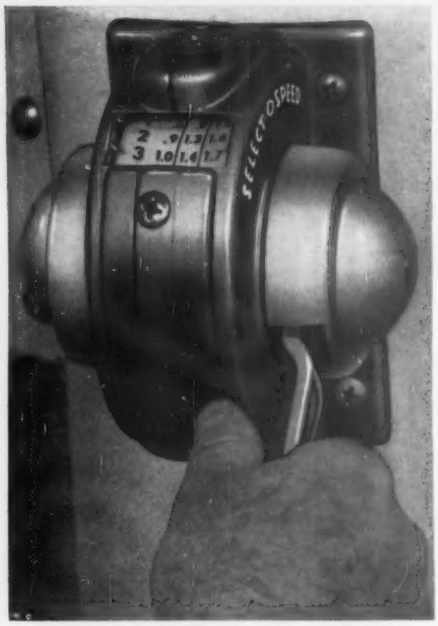

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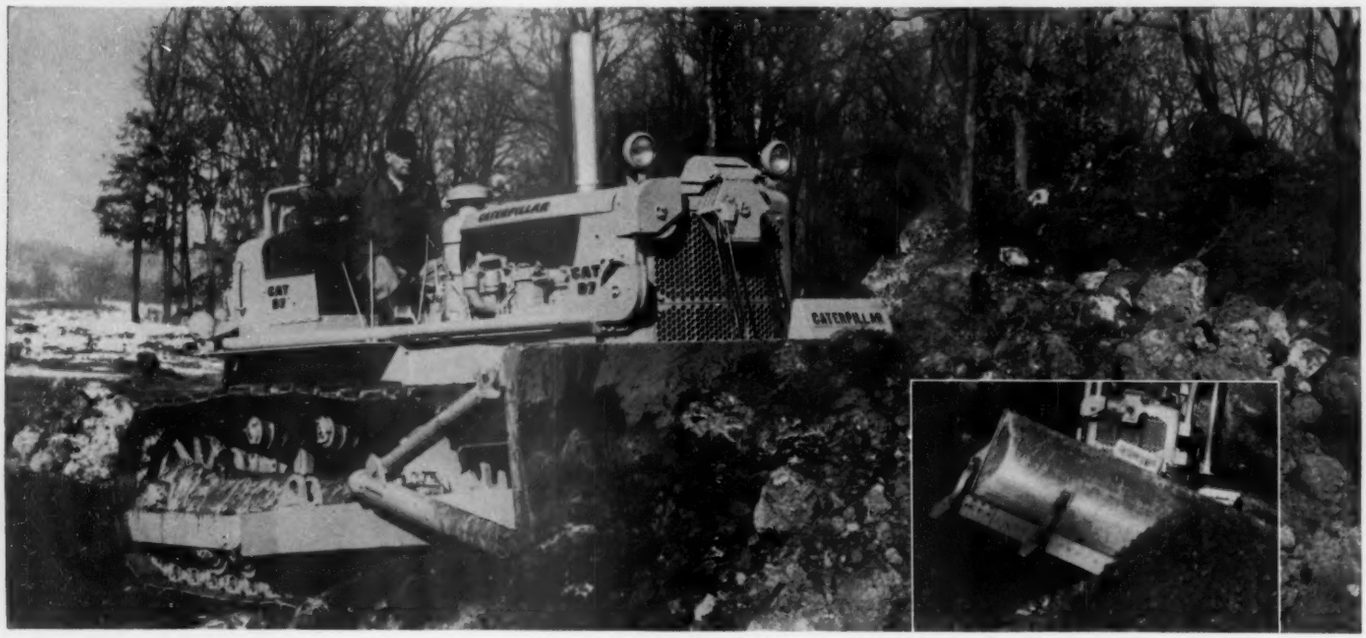

THE new Cat D7 Series D Tractor is champ, the top woods tractor in its class. It packs more power and more lugging ability than ever before—and now delivers more production at lower operating and maintenance costs. The payoff for you . . . increased performance that no other tractor in this power range can match.

Major improvements, developed by Caterpillar's Project Paydirt, affect the engine, power train and undercarriage. And the new Series D retains the exclusive Caterpillar oil clutch. The clutch is time-tested; delivers up to 2,000 hours—one whole season—without so much as an adjustment.

Also available is the versatile No. 7G Bulldozer (inset). It 'dozes and rips. It's ideal for logging work—ideal for high-speed clearing of stones, boulders, brush and trees. The blade has four teeth, and it can be tilted or tipped without the operator leaving the seat.

For complete facts about the new D7 Series D, see your Caterpillar Dealer. Ask him for a demonstration.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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PRESSURE-LUBRICATED POWER TRAIN insures complete circulation of filtered oil to transmission, bevel gear and pinion. To transmit increased power, power train components have greater strength. The payoff . . . trouble-free gear operation.

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Desirable Trees for Paper

Grow wood for these properties:

1. Above average fiber length
2. High per cent of thin-walled cells
3. 15-50% late wood growth
4. High cellulose content
5. Low extractive content

BY H. E. DADSWELL, Assistant Chief, and A. B. WARDROP, Senior Principal Officer Division of Forest Products, Commonwealth Scientific and Industrial Research Organization, Australia

Some, if not all, of the features listed above may be genetically controlled and it should be possible to develop trees with the required features by selective breeding. Means of assessing the wood qualities of trees that might be selected for breeding purposes are described.

• This industry is dependent for the greatest proportion of raw material from the forests which, in many parts of the world, have carried and still do carry abundant supplies of timber species which have proved suitable for all kinds of pulp and paper products.

As a result, the industry has tended to be rather complacent about its raw material, and there has been little or no concern about wood characteristics in relation to pulp properties. In those parts where native forests have been denuded or where they have been found insufficient to meet the growing demands to industry, efforts have been made over the years to establish plantations of selected suitable species. These efforts have been sponsored both by government and industry and in Australia and New Zealand they have been largely successful, but planning and planting programs have been developed over the past 30 years when there was no great concern about the wood quality of the crop. Fortunately the position is different today. In planning for the future the opportunity exists, as a result of recent developments, for growing of wood with pre-determined properties.

In the Division of Forest Products we have been conscious of the whole problem of breeding for wood quality and fiber quality for some time and have been actively co-operating with the Commonwealth Forestry and Timber Bureau and the Queensland Forestry Department in determining wood quality of trees selected as parents for tree breeding. Collaboration with the former body has covered experiments for the development by vegetive propagation of a strain of *Pinus radiata* with higher than average fiber length.

As a result of work on various species planted in Australia it is possible to select those qualities most desirable for general timber utilization. However, from the point of view of utilization by the pulp industry the picture is not nearly so clear. Work here and elsewhere does indicate the general course to be followed, but it is still essential to know what the industry wants. We are not alone in this lack of exact knowledge. Zobel has placed the above question before the United States pulp and paper industry[1] and in recent correspondence he has indicated that the industry is undecided and does not know exactly what it is looking for. Mitchell[2], on the other hand, while mentioning the possibilities of developing wood fibers tailor-made to the requirements of a particular product or end use, has emphasized the advantages of obtaining greater fiber yields per acre per year. This can be done he says, by increasing density and growth rate.

1. Start with Long Fiber Strains

It has been established that the average fiber length in most trees, when examined at any one level, increases through successive growth rings from the pith until a more or less constant value is attained[3] (**see Fig. 1**). The time taken to reach such a constant value depends on various factors such as species, environment, etc. However, it is usually 12-15 years in plantation grown softwoods in Australia and New Zealand, and somewhat longer in the eucalypt species in which the industry is interested. Thus there is a marked variation in fiber dimensions through the period of immaturity until mature wood is formed. Further, there is a variation in fiber length within any one growth ring[4] the fibers being shortest in first-formed early wood and longest in the last-formed late wood (except where compression wood is present). In softwoods, the variation throughout a growth ring is not very great, the late

Dr. H. E. Dadswell Dr. A. B. Wardrop

AUTHORS OF THIS PAPER, which after it was first given in Australia, drew favorable comments at the International Hardwoods Symposium held in Montreal last September, and a similar paper was read at the TAPPI meeting in New York in February, also by these authors. Both are with the Commonwealth Scientific and Industrial Research Organization, Melbourne. Dr. Dadswell is asst. chief and Dr. Wardrop, senior principal research officer of the Division of Forest Products of CSIRO.

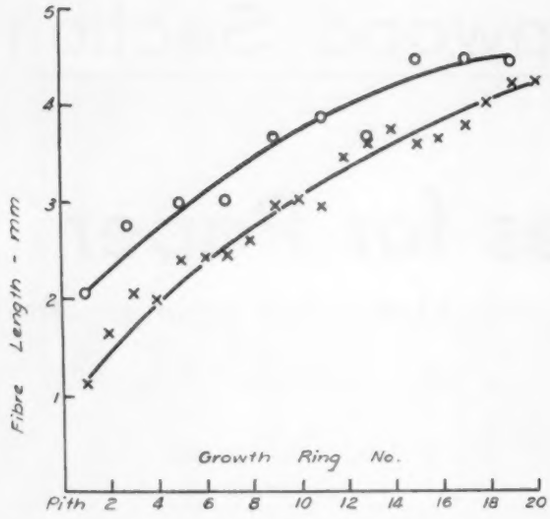

FIG. 1.—SHOWS INCREASE IN FIBER LENGTH OF LAST-FORMED LATE WOOD through successive growth rings from pith. Note that in one tree fiber lengths are shorter throughout range of growth rings than in corresponding rings in other.

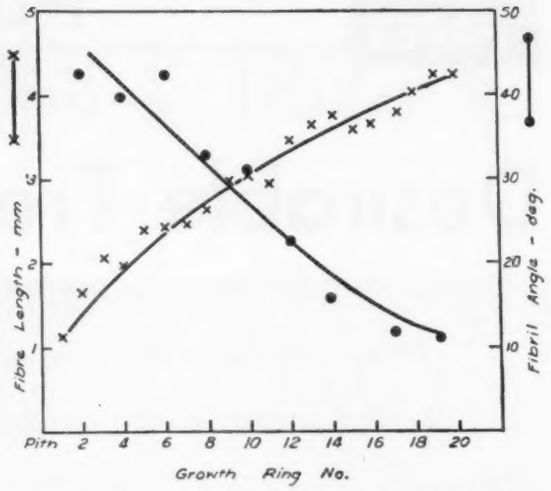

FIG. 2—CORRELATION BETWEEN FIBER LENGTH (X-X) OF LAST-FORMED LATE WOOD through successive growth rings from the pith, and fibril angle (o-o) observed in the same specimens as used for the fiber length determinations.

wood fibers averaging up to 12% longer than the early wood fibers. However, in hardwoods including certain eucalypts where there is definite late wood, the difference may be as great as 50 to 100%.

This change in fiber length during the period of immaturity is of importance to our industry because of the utilization of thinnings and tops, and because the volume of immature wood can be fairly high if harvesting takes place at a comparatively early age. However, it has been observed[5] that the average fiber length in the first growth rings of one tree is not always identical with that in another tree of the same species. In some cases it can be as much as twice as great and this difference is maintained through successive growth rings[5] (**Fig. 1**). This difference is apparently genetic. It can be readily seen that here is an important factor in the utilization of immature wood if fiber length is a quality desired by the industry.

Related to Pulp Strength

It is generally accepted that the fiber length of the wood is closely correlated with pulp strength properties especially tear, so that the greater the fiber length the higher is the tear factor. This is supported by such evidence as has been obtained on pulps from immature and mature wood of species of *Araucaria*[6]. The average fiber length from mature wood of these species may be as high as 7 mm. in comparison with an average of approximately half this figure in the case of the immature wood. Much lower tear factors have been found in the case of the sulfate pulps from the immature wood. Beating quickly damaged the very long fibers with appreciable loss in tearing strength.

However, it is evident that many other factors can influence the relationship between fiber length and pulp properties. Thus in work on the pulping of wood from succesive growth rings of *Pinus radiata* it was found[7] that there was a correlation between average fiber length and tearing strength over the early growth rings when the changes in length were greatest, but none in the later growth rings. Some degree of correlation was also observed between fiber length and breaking length and between fiber length and bursting strength. On the other hand, in similar experiments with a sample of *Pinus taeda* it was found that as fiber length increased, breaking length and bursting strength decreased[8]. In this species, however, the tearing strength continued to increase from pith to bark although it was apparent that other factors were involved.

It seems clear that insufficient is known about fiber length in relation to pulp strength properties, and it is difficult to isolate one factor from many others. However, it is evident that there are benefits to be derived from having as high a fiber length as possible in the utilization of immature wood from thinnings and tops. Thus, is would be desirable in any new plantation to start with a strain in which the initial average fiber length was high. Although no work in this direction has been done in the case of eucalypts, the same fundamental considerations apply.

Fibril Angle Indicates Length

This is the angle between the helically wound cellulose microfibrils in the middle layer of the secondary wall of fibers and the longitudinal cell axis. Within a tree the fibril angle changes with cell length over successive growth rings[5, 9], the angle being least in the longest fibers (**Fig. 2**). Because of this correlation, fibril angle is indicative of cell length and as such gives some information on the position in the tree from which the fibers are derived. In itself it does not seem to play much part in determining pulp strength properties because of the indiscriminate arrangement of the fibers in the test sheet.

However, the angle is important in determining strength properties of individual fibers. Thus, there is a definite relationship between fibril angle and tensile strength in cotton fibers, a small fibril angle being correlated with a high tensile strength[10]. A similar relationship has been observed for isolated wood fibers[11]. Also cotton fibers with a large fibril angle are known to have a superior folding endurance to those of ramie in which the angle is very small[12].

2. High Per Cent of Thin-Walled Cells

The importance of this feature of woody fibers has been stressed by Runkel[13] Mühlsteph[14] and others. It is closely related to wood density except

Desirable Qualities for Softwoods

1. **Higher than average fiber length for the species.**
2. **In plantation grown exotics late wood forming more than 15% of the growth ring, but not more than 50%.**
3. **Higher than average cellulose content for the species.**
4. **Low extractive content.**
5. **Provided 1, 2 and 3 are satisfactory a growth rate as rapid as the economics of plantation management will allow.**

Desirable Qualities for Hardwoods

1. **Higher than average fiber length for the species.**
2. **Cell wall thickness such that $2w/1<1$.**
3. **Basic density lower than average for the species (this will be correlated with cell wall thickness).**
4. **High ratio of fibers to vessels, rays, and parenchyma (also associated with density).**
5. **Low extractive content.**
6. **Higher than average cellulose content for the species.**
7. **Suitable hemicellulose content.**

in the case of those hardwoods which have large vessels, numerous vessels, and/or numerous thin-walled parenchyma cells.

Runkel has used the ratio $2w/1$ where w=wall thickness and 1= lumen diameter of the fiber, and has pointed out that favourable pulp strength properties are usually obtained when $2w/1>1$ but not when $2w/1<1$. This appears to be a very good guide in those cases where the growth rate is even throughout the year as in most tropical species. Where distinct growth rings are present there is a wide variation in cell wall thickness through the one growth zone.

Thin-walled fibers collapse and become ribbon-like thus providing a large surface area for bonding. On the other hand, thick-walled fibers do not collapse, are stiff, and retain their rounded shape during sheet formation. Although such fibers do not bond readily and are resistant to beating, they increase the tearing strength. Sheets made from thin-walled fibers of the same length are much weaker in tearing strength, but are superior in other properties.

Basic Density Reflects Wall Thickness

This is the ratio of the oven-dry weight to the volume of the piece when soaked to maximum volume (=green volume). It is found to vary in most trees from the pith to the bark, increasing at first, then becoming more or less constant. In larger trees the basic density decreases somewhat towards the outside of the stem. It reflects changes in cell wall thickness and is also closely correlated with percentage late wood in those species which have distinct growth rings. Determination of basic density can thus be one way of assessing wood quality for pulping. In the work done on successive growth rings from a tree of *Pinus radiata*[7] and one of *Pinus taeda*[8] it was observed that a high basic density was associated with high bulk and tear but a low folding endurance and breaking length for pulp from both early and late wood. This effect is, of course, most apparent in the comparison of pulps from early wood and late wood of the same species[8]. Also it has been observed that pulps from denser wood are less influenced by beating.

The increase in yield with increase in density in Southern pine has been referred to by Mitchell[2] and Chidester[15]. However, yield is only one factor to consider. What is more important is the behavior of the fiber in the formation of the sheet.

3. Late Wood—50% is Enough

Late wood is particularly prominent in coniferous woods from the temperate regions. It may be seen more or less clearly in the wood from these species grown in New Zealand and Australia, and also in certain of the eucalypt species growing at higher elevations. In certain native conifers such as those of the genera *Araucaria*, *Agathis*, *Callitris*, *Podocarpus* late wood bands are inconspicuous.

Where late wood is prominent the fibers of the late wood zone are observed to have very much thicker cell walls than those of the early wood of the same growth ring, the difference in the wall thickness being much more marked in soft-woods than in hardwoods. A close correlation exists between percentage late wood and basic density in coniferous timbers; there is usually an increase in the percentage of late wood through the successive growth rings from the pith until mature wood is formed. When the tree is mature variations in percentage of late wood may be associated with changes in environment.

Tearing strength and bulk increase with increase in amount of late wood, but bursting strength, tensile strength and folding endurance increase with greater proportions of early wood. Obviously a furnish of 100% late wood would be difficult to form into sheets and would give a very rough paper; on the other hand a furnish of 100% early wood, while giving satisfactory sheet formation and excellent tensile and bursting strengths, would be deficient in tear.

Long-fibered pulp from coniferous species in which a high percentage late wood is developed (50-75%) would be excellent for blending with short fibered pulp.

Just what percentage late wood is an ideal to aim at in breeding experiments is somewhat hard to determine, but it should preferably be no higher than 50%.

The properties of a 50-50 mixture of early and late wood fibers from *Pinus taeda* have been determined in a series of blending experiments[8].

Rate of Growth Alone Unimportant

The effect of rate of growth on wood quality has been the subject of much debate. Some, at least, of the conflicting statements arise from the fact that the immature wood developed in the early stages of the life of the tree is usually rapidly grown and lower in basic density than the mature wood. Further, the wood formed late in the life of a large tree is also of low density and has narrow growth rings. Thus low density has been associated with both wide growth rings and narrow growth rings. Recent research indicates, however, that in wood of the same age there is no relationship between ring width and basic density[16]. Thus, in mature wood either rapid growth or slow growth can produce wood of the same density (at least in the species in which we are interested). This is related to the fact that percentage of late wood is the important factor. Thus, from the pulping point of view, rate of growth by itself is of no consequence and therefore the forester can aim at the development of the highest possible volume yield per acre per annum.

The effect of both compression wood and tension wood on pulp properties has been adequately discussed elsewhere[17 18 19]. It is sufficient here to reiterate that in the management of any forest for a particular end use where particular care has been taken in the selection of the most desirable wood and fiber properties, every effort should be made to keep the development of reaction wood to a minimum. Certain characteristics relating to tree form are apparently inherited. These characteristics involve the formation of reaction wood and should be avoided in selection of parent trees.

4. High Cellulose Content Desired

There is little clear-cut evidence available on the requisite chemical composition of a wood desired to give a pulp suited for a particular purpose. This is not surprising when it is realized how widely chemical composition can vary from tree to tree and within a tree of a species. This applies not only to the cellulose, hemicelluloses, and lignin, but in particular to the extraneous materials which are of no ultimate value to the pulp and are expensive to remove. It is of interest, however, to note that the cellulose content rises through successive growth rings from the pith during the early life of the tree[7 8 20]. Further, Zobel and McElwee[21] have shown that when the immature wood has a high cellulose content the mature wood is also richer in cellulose.

Should Be Low in Extractives

It would seem that the wood of any species ideal for pulping would be low in extractives, have a higher than average cellulose content, and have a lower than average lignin content. The hemicelluloses are also important as they appear to assist in the development of strength properties during beating[22 23]. However, the exact amounts of such constituents that are desirable for most advantageous results are not very definite. In spite of the great advances in the chemical knowledge of wood and its constituents over the past 30 to 40 years a lot has yet to be found out regarding the interrelationships between cellulose, lignin, hemi-celluloses and pulp strength properties for a particular species.

Can These Qualities Be Attained?

There is every indication that fiber length, density[24 25] and, in all probability, percentage of late wood are genetic characters. In any case percentage of late wood and density are closely correlated. Whether high cellulose content can be controlled genetically has still to be investigated. One of the great problems in all this work is how to obtain an answer in a reasonable period of time.

Geneticists working with annuals have a definite chance of obtaining results quickly. With trees it is much harder, and if one had to wait until they reached maturity progress in this line of research would be slow. However, it has been found possible to get some idea of wood quality by the examination of the wood from young stems. It is because of this that we are so interested in the anatomical variations through successive growth rings from the pith.

The data obtained from the first few growth rings for the various features in which we are interested can be used to predict the wood quality at any age. Zobel and Rhodes[26] have reported that there is a correlation between density of the limb of a young tree and that of the mature wood that the tree will have when it comes to harvesting age. Thus, samples from limbs or increment borings from the main stem, or better still, cross sectional disks from the butt of the main stem taken from representative trees of the plantation will enable the wood qualities of the progeny to be determined.

Qualities of Parent Trees

Also to further test whether the selected qualities are transmitted to the progeny. How can this be done? Increment borings have been taken from living trees without any but localized damage. However, such specimens, even if they are up to the ½ in. diameter of the largest borer at present in use, are not sufficiently large for many of the necessary determinations of wood quality. Latterly, successful attempts have been made to obtain much larger specimens. Echols and Mergen[28] first developed this technique and following their procedures quite large specimens (2 in. longitudinally x ⅝ in. tangentially) taken from bark to pith of elite trees of *Pinus elliottii* selected as prospective parents on the basis of free form, vigor, branching habit, etc. have been obtained by the Queensland Forestry Service. These specimens are being used at the Division of Forest Products. In similar work with *Pinus radiata* the Forestry and Timber Bureau, Canberra, has developed a method of taking a specimen 2½ in. square from bark to bark through the center of selected trees. Their specimen is shown in **Fig. 3.** The Division of Forest Products is also examining the wood properties of this material.

From the data obtained a suggested order of priority on the basis of wood properties can be provided. Trees chosen as desired parents will provide material for vegetative propagation or grafting and so progeny can be developed quickly for planting out in a seed orchard.

In the work now being carried fiber length and percentage of late wood are being determined. We believe that these are the two most important features in plantation grown softwoods with respect to pulp and paper production and they can be used in selective breeding. The proof of the inheritance of these features will, of course, be found on sampling the 1 to 3 year old seedlings.

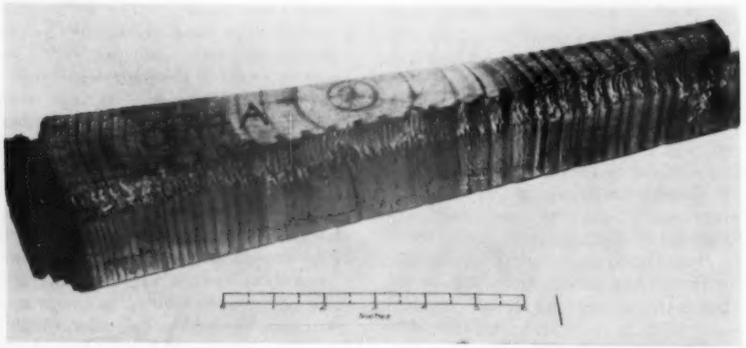

FIG. 3.—SAMPLE TAKEN FROM LIVING TREE for use in determination of wood properties.

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(This paper was presented at a recent meeting of the Australian Pulp and Paper Industry Technical Association.)

Further Report on Desirable Wood Properties in New York

At the recent U.S.A. annual technical meeting in New York, H. Dadswell, A. J. Watson and J. W. P. Nicholls of the Division of Forest Products, Commonwealth Scientific and Industrial Research Organization, Melbourne, Australia, made this further report on their study of desirable wood properties for paper:

"Work has been carried out to determine the separate effects of cell length, cell wall thickness, pentosan content, and lignin content, in each case keeping all other factors constant. By this means the marked increase in tearing strength with increase in cell length has been established; the effect of cell wall thickness on pulp strength properties other than tear has been further emphasized; a wide range of pentosan content in hardwoods (between 7 and 15%) can be tolerated without loss of pulp strength although with reduction in yield at the lower values; for best pulp strength complete elimination of lignin is highly desirable.

"In addition it has been shown that in the softwoods and hardwoods investigated the cellulose content (Cross & Bevan) increases through successive growth rings from the pith becoming more-or-less constant after 6-8 years of growth; also that in different trees of the species, the cellulose content varies markedly, some trees having almost 10% more than others. It has therefore beeen reiterated that cell length which is correlated with cellulose content, and basic density which is a very good index of cell wall thickness are characteristics that have to be considered in tree breeding work."

Leaders Emphasize Research Need

Rapid population growth calls for more scientific aids to production of fibers, more lands must be put to use by planting

● Vast changes in forests, forest products and manufacturing processes during the coming fifty years are predicted by North American forestry leaders. Speakers at the Forestry Centennial Conference, held in Corvallis, Ore., in conjunction with the observance of Oregon's 100 years of statehood, pictured a future of increasing population consuming more and better products from the forests.

An emphasis on the pressing needs for fundamental research across the whole forestry frontier pervaded these presentations.

Four Goals Outlined

Robert W. Cowlin, director of Pacific Northwest Forest & Range Experiment Station, Portland, Ore.—"Since commercial forest land is now producing less than half the amount of our estimated year 2,000 needs in terms of sawtimber, four things are plain: 1. We do not have any excess of commercial forest land; 2. Productivity of our forest lands must be increased greatly; 3. We must utilize forest growing stock more effectively; 4. We need strong research programs to accomplish these objectives.

"About research. Expenditures for all types of research in U.S. represent about 1.3% of total consumer expenditures; the rate for forest research is less than 1/6 of this—0.2% of consumer expenditures for forest products.

"I believe a reasonable estimate of the minimum 1975 goal for total annual expenditures for forest research by all agencies in the Pacific Northwest is $15 million exclusive of capital investments in physical plant and related facilities. Between now and 1975 I believe we should invest at least $10 million in new research construction."

Must Plant More Trees

Leo A. Isaac, Portland, who recently returned to the U.S. following 27 months in Turkey as UN forester —"Oregon, the leading lumber producing state, may well retain that leadership because much of its land is high in growth capacity and chiefly valu-

able for forest purposes. But throughout the world, and especially in the U.S., the area of virgin forest is dwindling and will soon disappear in settled countries. As that comes to pass, timber will be raised as a long time crop and the growth rate and quality of trees will be as important as quantity or number of trees, if not more so."

Must Learn Growth Factors

Harold J. Lutz, School of Forestry, Yale University, New Haven, Conn.—"As foresters become increasingly concerned with the maximum quantity of wood and fiber that can be produced per unit area, we will have to learn more about how trees grow. The relations of growth conditions to the structure and properties of wood is a field that, although holding great promise, has received relatively little attention.

"Not only must we expand our knowledge of trees as individuals but we must come to know the forest, which is more than a mere aggregation of trees. In the years ahead we will be more and more concerned with how forest soil conditions can be maintained and how they may be improved for optimum production.

Virgil H. Freed, agricultural chemist, Oregon State College—"Potential use of chemicals in forestry is immense. It is possible to foresee when chemicals will increase our timber production greatly by judicious use."

Dr. V. J. Nordin, associate chief of forest biology, Dept. of Agriculture, Ottawa, Can.—"The most urgent need in forest pathology is for a greatly broadened program of basic research on the ecology, biology, and physiology of disease pathogens and tree hosts and their inter-relationships in forest stand development as a sound guide for disease control."

Need More Research on Insect

Philip C. Johnson, entomologist of Intermountain Forest & Range Experiment Station, Missoula, Mont.—"Forest entomology, during its first fifty years as a recognized science, has shown insects to be one of the prime causes of (1) tree mortality, (2) reduced growth, (3) stem deformity, (4) seed destruction. There is yet a vast amount of research needed before foresters can consistently grow insect-free trees and wood."

Dr. A. K. Esterer, professional specialist, Central Research & Development, Weyerhaeuser Timber Co., Longview, Wash.—"The ultimate goal for utilization of the tree should be the production of one or a few key chemicals which can constitute the basis for a large and flexible industry of wood-derived products and establish the forest as a major supplier for the chemical industry."

R. P. Conklin, vice pres., Cascades Plywood Corp., Portland, Ore.—"The second-growth economy of the next 100 years of forestry will create a new approach to planning and operations."

Dr. Robert W. Hess, director of research, Georgia-Pacific Corp., Portland, Ore—"We can expect not only changes in methods of manufacture but also modification of old materials and introductions of completely new types of products. From a utilization standpoint, the paramount problem in the future will be quality not quantity."

Speakers at Forestry Centennial

DEAN WALTER F. McCULLOCH, School of Forestry, Oreg. State Col., developed hosted conference.

DEAN HENRY J. VAUX, U. of Calif. School of Forestry, presided over two-day session.

LEO A. ISAAC, international authority on seed selection, returns from 2 yr. assignment in Turkey as U.N. forester.

ROBERT W. COWLIN, director of Pac. Northwest Forest Experiment Station, Portland, Oreg. terms research "inadequate".

J. ALFRED HALL, director U. S. Forest Products Laboratory, Madison, Wis., says 600,000 tons/yr. increase needed in pulp.

More or Less Wood For More People?

In relation to future timber demands, Asst. Secy. of Agr. Ervin L. Peterson, addressing the Oregon State College forestry banquet following the centennial program, cautioned against lack of provision for "a particular kind of new forest" to replace present stands as they are harvested, Such absence resulted in "marked diminution in the ability of forest areas to sustain their contribution to the nation's need for wood and other forest values" in earlier eras.

"Today," according to Mr. Peterson, "each U.S. citizen has the benefit of 78 cu. ft. of wood which he uses in some form—as wood or derived products. If our population doubles as we expect in fifty years, we must either cut twice as much timber . . . or cut what we now cut and give each person 39 cu. ft.—half the present use.

"I don't believe wood is going to become less and less useful. Quite the contrary. It should become more useful. We can make is so. We have much of the know-how already."

Regarding government Mr. Peterson says: More and more people are demanding of government the assumption of all kinds of responsibilities of which the people are capable. As government has responded, it has necessarily taken in taxes more of the rewards which come from the application of individual creativeness and industry. As it has done so, people are less able to do for themselves. They again ask government to assume still additional programs. And so, the process repeats itself.

Needed: A Long-Range Timber Goal

. . . Senate committee hits lack of planning in National Forest sales. Sen. Murray Calls for "active, firm" policy

• Substantial increases in timber harvests may be realized if there is developed a long-range goal for national forest timber programs.

In a recent report, Sen. James E. Murray (Dem., Mont.), chairman of the Senate Committee on Interior and Insular Affairs, called for recognition of the lead time required to efficiently prepare an adequate number of timber sales. "To improve service to the forest industry and to assure the best type of forest management," he said, "there must be a full 'pipeline' of planned sales."

The national forest survey was undertaken by the Senate committee as a result of allegations that the United States Forest Service is not adhering to its published timber sale announcements and because of the "substantial gap" between sales volume and allowable cuts. The study was made by Robert E. Wolf, forest consultant, and included on-the-ground reviews of selected USFS forests.

Following publication of the Wolf report, Sen. Murray pointed out that—in addition to inadequate budget requests—the national forest timber program has been hindered because "several hundred million board feet of proposed timber sales have been tied up by the absence of an active and firm Dept. of Agriculture policy on government access to national forests."

Staff Report Recommendations

1. National Plan Needed. Because of the rapidly growing importance of national forests, there is urgent need for definite management goals fixed to a point in time, explained as to objective and relating operating and investment requirements to benefits.

The national plan should set forth forest management goals for the future, adequately describing (a) timber harvest goals; (b) reforestation and silvicultural work needed to attain optimum production; (c) recreation, watershed protection, grazing goals and land-use adjustments needed to harmonize multiple uses; (d) estimates of the role national forests will play in the national economy; (e) road and servicing facilities needed for management and operation; (f) cost estimates to reach stated goals within the first five-year period, as well as over-all costs.

2. Lack of Access Holds Up Sales. The lack of right-of-ways has been the major factor holding up planned timber sales in the period studied. The report specifies over 1.5 billion board ft. "in unmade or delayed planned" sales due to access deficiencies in two national forests.

"Orderly, Firm and Fair"

The USDA "should set forth a right-of-way policy and an active, adequately financed program geared to solving problems in an orderly, firm and fair manner. . . Timber management is not possible without permanent access arrangements."

3. Inadequate Records. USFS timber sale records are not sufficient to reveal significant and important facts on a timely basis for this $100,000,000 per year business. The forests service's use of "timber cut" as an expression of achievement "is incomplete and misleading because it fails to properly describe accomplishments". Minimum elements of the sale programs should include: (a) Timber volume in the various stages of sale preparation; (b) sales planned for the coming year with appropriate information on size, cost of accessory purchaser roads and anticipated rate at which sales will actually be "loggable;" (c) timber volume under contract and the rate it will be logged in the forthcoming year.

4. Correlated Standards do Not Measure Current Costs. Sales plans are not coordinated with funds. The USFS procedure enable it to define its needs but often lags behind current costs, resulting in insufficient timber-sale fund requests to advance sales to the maximum level of operation.

5. Personnel Transfers, Incomplete Sale Records Hamper Efficiency. "The ever-present need to transfer people should not be used as a crutch to excuse shortcomings."

6. Announced Plans Exceed Timber Sold. A major causative factor of this review was a consistent error on the part of one region "in announcing annual timber sale plans with definite sale dates that were not fulfilled either on schedule, for each of the listed sales, or in total quantity. . . . Care should be taken that future plans are absolutely related to realistic, financed programs, and that full public information is available on the exact cause for not currently offering the planned sale or for sale delays."

7. Roads Needed for Permanent Cut Expansion. However, salvage plans can be increased now. With rare exceptions, USFS has not sold the full amount of timber available for sale under sound forest management.

5-to-1 Return

"Beyond the allowable cut there is a volume of timber, excluded from cutting budgets, that is considered normal mortality loss due to age, insects or disease. It is composed of scattered trees throughout the forest salvable only by small sales. Salvage sales in already roaded areas offer a quicker method of temporarily raising sales levels, although they do not solve the basic management problem. Where there is a road system 'in' this timber can be readily marketed, can be cut immediately. These sales fit the needs, buying habits, and financial ability of many small loggers. Because this volume will be 'lost' if not salvaged, further because virtually no road investment (either public or private) is needed to cut it and finally because the return to the treasury on direct cost will be 5-to-1, this opportunity to raise the total volume harvested should be diligently utilized."

8. Sale Size Affects Cost and Opportunities for Firms to Secure Timber. The cost to USFS for processing sales varies with sale size. Forest sales size plans and the size of the actual sales do not always agree. "If the objective is to sell timber at the lowest expenditure of appropriated funds, large sales would be the answer. If the objective is to provide the broadest opportunity to all segments of the industry to bid for timber, and in the process to insure the fullest chance for price to be set by the industry, medium and small sales should predominate."

9. Improved Sale and Road Plans. A considerable volume in proposed sales has been deferred and replanned because on-the-ground examination revealed errors in the original sale plan or estimate. Improved presale reconnaissance will help firm up plans.

APA Pinpoints Progress, Problems

1. Impact of recreation. 2. Utilization. 3. Wood quality evaluation from increment cores. 4. Improvements in woodyards. 5. Improving small woodlands. 6. Pesticides. 7. Tree planting. 8. Hardwoods.

1. Impact of recreation

● Recreation is a tremendous force in the U.S.A. today. More leisure time for America's workers has projected recreation into the forefront of their daily life, so much so, that more than 1.5 times is spent for recreation than for clothing and shelter.

Future demand for recreational facilities is expected to soar tenfold. This is the problem discussed at the forest policy forum of the American Pulpwood Assn. on opening night of its annual meetings during Paper Week. Bernard L. Orell, vice president, Weyerhaeuser Timber Co., chaired the discussion panel consisting of Ernest F. Swift, executive director, National Wildlife Federation (hunting and fishing); Irving K. Fox, manager, Water Resources, Resources for the Future, Inc. (water conservation); C. West Jacocks, state park director, South Carolina State Commission of Forestry (camping and picnicking) and Arthur H. Carhart, author (land use planning).

The big problem is to reconcile the primary interests of private forest owners, such as pulp and paper companies, with the public's need to recreate. There are many areas of agreement and disagreement. Some would champion all uses on all lands; others specific uses on all lands. The one aim is to get a maximum crop (whether it be timber, game or recreation).

2. Utilization

George W. Abel, director of technical forestry, Owens-Illinois Glass Co., Jacksonvillle, Fla., said new processes and products provide the pulp and paper industry with its most significant opportunities for increasing utilization profits from pulpwood.

Faced with rising costs of pulpwood production that are making up increasingly more of total manufacturing costs, the industry is doing research and developing new ways to reduce or even control the wood cost/pulp value ratio.

The need, he stated, is for new product possibilities researched, developed, engineered and sold from pulpwood components the industry is now throwing away, or using to a substantially lower profit return than they might be.

3. Wood Quality Evaluation from Increment Cores

Specific gravity or density of wood from Southern pine varies with the latitude and longitude in which the trees are grown, reports Harold L. Mitchell, chief, Division of Timber Growth and Utilization Relations, Forest Products Laboratory, Madison, Wis., and Philip R. Wheeler, Southern Forest Exp. Station, New Orleans, La.

The timber industry is vitally interested in specific gravity, they said, since it is the simplest single index of wood suitability for many important uses. Specific gravity of pines largely determines kraft pulp yield from a cord of wood. It is also correlated with the mechanical strength of wood, aids in the selection of timber for premium lumber, poles, and other products.

4. Improvements in Mill Yards

F. W. Cowan, resident manager, St. Regis Paper Co. at West Stewartstown, N.H., said "More efficient wood handling and storage would be aided by keeping the yard clean of debris, by having paved roadways and by keeping inventories as small as possible. A mill should encourage local standardization of truck bodies and railroad cars to permit uniform mechanical loading. Consideration should be given as to the best length for pulpwood, in line with improved logging and handling techniques."

Mr. Cowan said that concentration yards near major sources of wood, but on railroads or all weather highways, offer one alternative to large inventories of wood at the mill yard. Chipping at points near wood sources can simplify woodyard layouts and should lower handling costs.

5. Improving Small Woodlands

A. J. Coutu, associate professor, North Carolina State College, School of Agriculture, Raleigh, N.C., challenged the belief that apathy on the part of small woodland owners is due to a lack of technical information.

Speaking of the factors involved in the low levels of forest management practiced by the small woodland owner, Mr. Coutu said, "These conditions reflect a need to integrate technical and economic analysis in a more complete educational package."

6. Pesticides

Roger D. Hale, vice president, The Conservation Foundation, New York City, described aerial spraying for spruce budworm in Maine in 1958 as "an example of a well-planned, very carefully executed spraying program with the people of the area being adequately informed in advance about what was taking place.

Mr. Hale said that the Dept. of Agriculture spraying program of DDT in the Northeast to control the gypsy moth, and the program to "eradicate" the fire ant in the South with Dieldrin and Heptachlor, has created bad public reactions to spraying programs generally.

7. Tree Planting Developments

R. V. Malecki, superintendent, technical control Dept., Union Bag-Camp Paper Corp., Savannah, Ga., said that forestry and land management were emerging from their cocoon of "caretaking and fire fighting" and that top executives are now focusing their attention upon management of their forest resources.

He said pulpwood is becoming a primary crop rather than a secondary or tertiary one. "Delays in harvest areas of 3 to 5 years of waiting for natural seeding became economically inexcusable with 30 and 35 year rotations. Restocking of pine trees began to be a paramount objective of all thinking landowners. In other words, tree planting is becoming a major technique in managing woodlands."

8. Hardwoods

D. J. MacLaurin, chief of the Pulping and Papermaking Section of the Institute of Paper Chemistry, Appleton, Wis., said American forests are about 30% hardwoods and 70% coniferous trees; that the inventory of hardwoods is increasing quite rapidly, while the inventory of coniferous trees is barely holding its own. He said that although pulp and paper uses about one-fifth of the total domestic wood cut each year, over 80% of this is from coniferous trees.

The full text of all the papers of the annual meeting of the American Pulpwood Assn. will be printed exclusively in the 1959 PULPWOOD ANNUAL, issued in May.

Pulp Washers that give a "Shower of Value!"

Essential to the economical production of quality paper, a well-washed pulp with low dilution is mandatory at Thilmany Pulp and Paper Company.

That's why the Kaukauna, Wisconsin papermaker relied on Swenson to provide the washers that furnish clean pulp at the lowest possible dilution. Now, with its line of Swenson 4-drum, 5-stage brown stock washers, Thilmany reports improved performance . . . *and* marked reductions in operating costs accompanied by an increase in quality of paper.

Long-time favorites, Swenson Pulp Washers are designed and engineered specifically for brown stock washing. Send for your copy of the interesting new color Bulletin 243, "Processing Profiles"—a tour of Swenson Processing Equipment in action at Thilmany and many other installations.

Swenson Evaporator Company, 15632 Lathrop Avenue, Harvey, Illinois. **75th YEAR**

87 OF AMERICA'S "FIRST HUNDRED" CORPORATIONS ARE WHITING CUSTOMERS

SWENSON

Proved Engineering for the Process Industries Since 1889

A Division of **WHITING** Corporation

WHITING—MANUFACTURERS OF CRANES; TRAMBEAM HANDLING SYSTEMS; TRACKMOBILES; FOUNDRY and RAILROAD EQUIPMENT

ALBACEL & ASTRACEL

CHLORINE DIOXIDE BLEACHED SOFTWOOD SULPHATE

CHLORINE DIOXIDE BLEACHED HARDWOOD SULPHATE

Balanced Paper-Grade Pulps Created by Papermakers for Papermakers

Throughout the free world [illegible] use and like Riegel's
[illegible] and Astracel [illegible] paper [illegible] the right balance of all important qualities
[illegible] the [illegible] [illegible] [illegible]

Strictly Personal

Midwest

Container Corp. of America, Chicago, has named EDWARD T. HAYES director of traffic to succeed GAIL R. GORDON, who has retired following 31 years' service. Mr. Hayes joined Sefton Mfg. Co. (now a Container Corp. division) in 1923, was made asst. traffic mgr. in 1931 and mgr. in 1950. . . . OSCAR A. TINKER is named chief engineer for fiber drums in the Fibre Drum & Corrugated Box div. of Continental Can Co. He headquarters at the division's master laboratory in Van Wert, O.

DR. ANDREAS VON KOEPPEN becomes research professor in paper technology at Western Michigan Univ., Kalamazoo. He continues on the staff of American Box Board Co., Filer City, and will teach one class in the dept. of paper technology while continuing his research work. Dr. von Koeppen is a graduate of the Institute of Cellulose Chemistry, Darmstadt, Germany, and was with West Virginia Pulp & Paper Co., Covington, Va., prior to joining American Box Board. . . . ROBERT T. SEITH, asst. to the sales mgr., has been named asst. sales mgr. for

Black-Clawson Announces Major Management Changes

Hein ..... Hartford ..... Vokes ..... Landegger ..... Weber

As of May 15, OTTO W. HEIN, vice pres., transefrs from gen. mgr. of the Paper Machine div., Watertown, N. Y., to corporate staff as vice pres. in charge of interdivisional coordination of plant production, industrial relations and company-wide capital investment. He will concentrate on supervision of shop production for all six domestic and foreign plants, will headquarter in Middletown, O.

JOSEPH E. HARTFORD, vice pres., will be gen. mgr. of the Paper Machine div., transferring from gen. mgr., Shartle div., Middletown. He was at one time asst. gen. mgr. of the former Paper Machine div., Hamilton, O.

Effective Sept. 15, ROBERT F. VOKES, vice pres. of administration, transfers to Shartle div. gen. mgr. He was at one time director of research.

CARL C. LANDEGGER, asst. gen. mgr. of the Paper Machine div., is appointed vice pres. effective May 15. He will serve as Shartle div. acting gen. mgr. until Sept. 15, when he transfers to the New York, corporate office as admin. vice pres.

SAMUEL T. WEBER, Paper Machine div. sales mgr., is named a vice pres.

SWINERTON & WALBERG CO.

Founded 1888

BUILDERS OF PULP AND PAPER MILLS AND CONVERTING PLANTS, WE PERFORM GENERAL CONSTRUCTION, COMPLETE EQUIPMENT ERECTION AND PROCESS PIPING . . . . . WITH OUR OWN FORCES

Recent and Current Projects:

Fibreboard Products Inc.	Kraft Pulp and Paper Mill	East Antioch, California
Kimberly-Clark Corporation	Creped Wadding Mill	Fullerton, California
Container Corporation of America	Boxboard Mill	Santa Clara, California
Potlatch Forests, Inc.	No. 4 Paper Machine	Pomona, California
Fibreboard Products Inc.	Converting Plant	Denver, Colorado
Cascade Kraft Corporation	Kraft Pulp and Paper Mill	Wallula, Washington
Continental Can Company (Robt. Gair Paper Products Group)	Stock Preparation Expansion	Los Angeles, California

MAIN OFFICE

200 BUSH STREET, SAN FRANCISCO 4

Branch Offices: — LOS ANGELES — OAKLAND — SEATTLE — DENVER — SALT LAKE

Reduce Maintenance Coating Costs—

Carboline Systems are Keyed To Your Job

Many maintenance paint dollars are wasted on so-called "cheaper" paints. Moreover, no **one** coating system can perform equally effectively under **all** conditions. Either way premature failures occur, requiring costly re-painting. You can substantially cut maintenance costs by specifying systems that are keyed to your requirements.

Four Carboline maintenance coating systems, thoroughly proven in service, are recommended for specific corrosive environments. Each system is "keyed" or tailor-made for a particular type of job. And each is designed to provide maximum protection for the longest time at the lowest cost per square foot per year of service.

CONDITION 1

Mild fumes, splash or spillage of most acids and alkalies. Continuous temperatures to 150°F. where maximum surface preparation is not practical. Structural steel, pipe, walls, equipment exteriors. **Carboline CS-200 (all vinyl) system.**

CONDITION 2

Severe fumes, splash or spillage of acids and alkalies. Continuous temperatures to 180°F. Structural steel, equipment exteriors, concrete walls. **Carboline Epoxy 188.**

CONDITION 3

Heavy duty protection against solvent, caustic and acid spillage. Continuous temperatures to 200°F. Structural steel, equipment exteriors, concrete. **Carbomastic #3 (epoxy tar) and Phenoline 305 topcoats.**

CONDITION 4

Economical, easily applied maintenance system for mild chemical fumes. Requires minimum surface preparation. Continuous temperatures to 200°F. Can be used over old paints. **Carboline Epoxy 110.**

Write for newly released Chart No. 5 showing comparative ratings of coating systems by physical and chemical properties—an engineering aid in choosing the most efficient protection. Also ask for technical data and recommendations on Carboline maintenance systems.

carboline COMPANY

32-O Hanley Industrial Ct.
St. Louis 17, Mo.

Atlanta • Buffalo • Denver • Detroit • Houston • Los Angeles • Mobile • New York • Pittsburgh • San Francisco • Tampa • Tulsa • Toronto

Specialists in Corrosion Resisting Coatings and Linings

Mosinee Paper Mills Co., Mosinee, Wis. He joined the firm in 1949 as a research chemist and later was made dir. of product development.

DR. WILFRED GALLAY, director of research for the E. B. Eddy Co., discussed "The Development of Strength in Paper" at the February meeting of Ohio TAPPI. The four principal aspects relative to acquiring satisfactory strength, he said, are (1) fiber strength, (2) fiber toughness, (3) the interweaving of fibers and (4) the bonding of fibers. . . . FRANK SCRIBNER has been named project engineer with Patton Mfg. Co., Springfield, O. Prior to joining the firm he was with Manchester Machine Co., Oxford Miami Paper Co. and Mokrey Tesmer Co.

JOSEPH A. ACKERMANN, for the past three years chief engineer, has been named sales mgr. for Elwell-Parker Electric Co., Cleveland. Mr. Ackermann, who joined the company in 1923 as a draftsman, is being succeeded by JOHN A. DRAXLER, formerly asst. chief engineer. . . . GORDON B. BONFIELD, senior vice pres. of American Box Board Co., has accepted for his firm the fourth annual award of the Assn. of Great Lakes Outdoor Writers. The presentation was made on "Michigan Outdoors", a television program aimed at Michigan listeners, "for outstanding accomplishment in conservation of our natural resources."

EDWARD J. BARCAL JR. is new mgr. of the Midwestern territory for the Alloy Tube div., Carpenter Steel Co. He covers Illinois, Wisconsin, Minnesota and North and South Dakota. . . . DONALD M. MAHADY has been named Midwest belting engineer by United States Rubber Co. He was formerly an engineer at the Passaic, N. J. plant. . . . LAWRENCE R. LAFFEY becomes Chicago sales office representative of Allis-Chalmers Mfg. Co.

Mead Pulp Sales Names George H. Cash

. . . technical consultants for sales, engineering and design of paper machine hoods and allied equipment. Prior to joining the Dayton, O. firm, Mr. Cash was sales mgr. for the Paper Mill div. of Industrial Air Co. He was formerly with York Corp. and J. O. Ross Engineering Corp. (In 1958 Mead Pulp Sales was appointed exclusive distributor for fiberglass paper machine hoods and equipment manufactured by Corrosion Controllers Inc.)

Named to similar positions in St. Louis were CLYDE A. TAYLOR and JAMES R. HODGSON. All are graduate engineers.

RICHARD C. PHELPS is named customer service group leader for U. S. Industrial Chemicals Co. Formerly a technical service engineer, he is headquartered at the Tuscola, Ill. polymer service laboratories and in his new position supervises technical service for Petrothene polyethylene resins. . . . HAROLD F. TOLNITCH is new sales mgr. for machine knife products at Simonds Worden White Co., Dayton, O. Mr. Tolnitch, a member of TAPPI, has been asst. sales mgr. since 1955.

McCorison Succeeds Jennings as Thilmany President

McCorison

Jennings

Peters

Thomas

GUY E. MCCORISON, formerly sales vice pres., has succeeded E. H. JENNINGS as president of Thilmany Pulp & Paper Co., Kaukauna, Wis. Mr. Jennings becomes board chairman to fill the vacancy caused by the retirement of KARL E. STANSBURY, who continues as a director. C. R. SEABORNE, formerly exec. vice pres., also retired but remains to serve the firm as a director and consultant. C. L. DOSTAL continues as vice pres. in charge of manufacture.

Succeeding Mr. McCorison as sales vice pres. is H. O. PETERS, a vice pres. and formerly Chicago sales div. mgr. J. T. THOMAS, formerly Detroit sales div. mgr., becomes vice pres. for marketing.

Mr. McCorison came to Thilmany in 1936, was elected to a directorship in 1941 and in 1947 became vice pres. and asst. sales mgr. He was placed in charge of sales in 1950. . . . Mr. Jennings joined the firm in 1916. In 1928 he was elected a director and asst. sec. and in 1936 vice pres. and sales mgr. He succeeded Mr. Stansbury as president in 1950. . . . With Thilmany since 1906, Mr. Stansbury became a director in 1913, sec. and sales mgr. in 1916, vice pres. in 1919, president in 1936 and board chairman in 1950.

With these 3 RIDGID® Jam-Proof Pipe Threaders my power drive threading is Safe—no watching to keep them from jamming...save me a lot of time, too!

1" to 2" Pipe
RIDGID 65R-TC

Jam-proof—can't jam if you forget it . . . Threads 4 sizes of pipe and conduit with 1 set of dies . . . True-Centering workholder—no more crooked threads—but adjustable for drip threads. Far more for your money—compare!

2½" to 4" Pipe
RIDGID 4PJ

Jam-proof . . . drive pinion kicks out automatically—real safety when power threading. Workholder sets to size before putting on pipe. Other exclusive advantages. Special 4PJ for conduit.

4" to 6" Pipe
RIDGID 161

Jam-proof for safe power threading. 1 set of dies threads 4", 4½", 5" and 6" pipe and conduit—sets to size fast. Workholder sets to size before putting on pipe, a work-saver feature. Many other reasons why the 161 is your best buy!

See and try these popular RIDGID Threaders...at your Supply House.

THREADED PIPE...It's Tight...It's Best...Costs Less!

PULP & PAPER

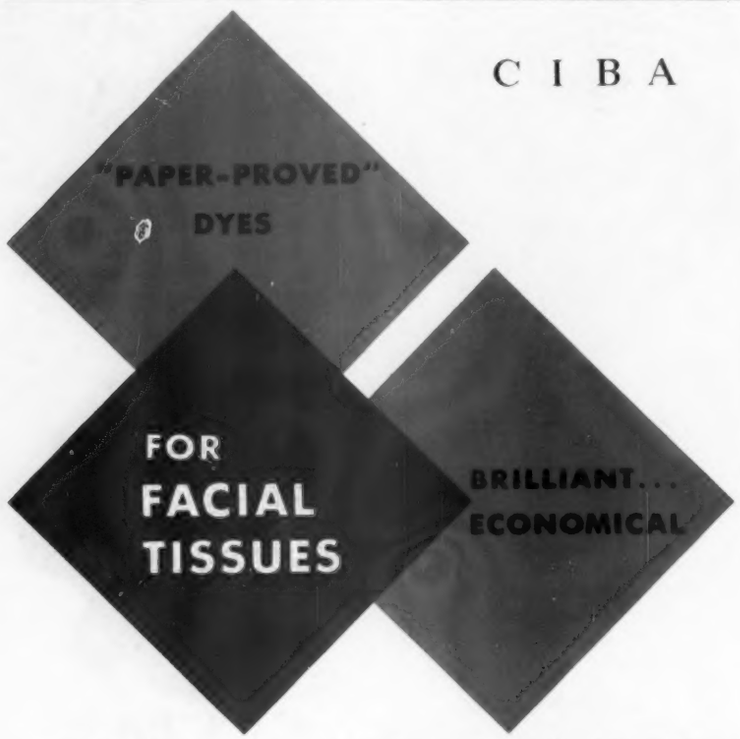
Strictly Personal

STANTON W. MEAD will address the annual luncheon during the Tenth TAPPI Coating Conference to be held May 25-27 at the Statler Hilton, Boston. Mr. Mead is president and gen. mgr. of Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis. . . . Champion Paper & Fibre Co., Hamilton, Ohio, has been awarded a Freedoms Foundation George Washington Honor Medal for its motion picture, "1104 Sutton Road." The film is based on an examination of productivity as it relates to the individual. According to DWIGHT J. THOMPSON, exec. vice pres. for personnel and public relations, and R. C. SKILLMAN, director of public relations, "'1104 Sutton Road' is really a picture about how to get more of the things you really want and need."

D. O. ANDERSON, northern Ohio representative for the Miehle Co. div. of Miehle-Goss-Dexter Inc., has added to his responsibilities the sale of paper cutting and bindery equipment made by Lawson Co., also an M-G-D division. . . . FRANKLIN F. FROTHINGHAM died recently after a one-year retirement from Bird Machine Co., South Walpole, Mass. Mr. Frothingham had served for many years as mgr. of the firm's Midwestern office in Evantson, Ill., before being transferred to South Walpole as vice pres. and mgr. of pulp and paper machinery sales.

ARTHUR C. DRESHFIELD has resigned as director of the Specialties div., Chicago Testing Laboratory (now known as Chicago Paper Testing Laboratory Inc.) to become director of paper research and development in the Chemicals-Pigments-Metals div. of Glidden Co. He will headquarter in Baltimore at the division's papermaking and coating research laboratory. Mr. Dreshfield became director of Chicago Testing on its establishment and is being retained by the firm in a consulting capacity.

ROBERT E. BORDEN is director of information for Folding Paper Box Assn. of America, Chicago. He was formerly public relations director for the Donahue Organization, Chicago public relations and fund-raising firm.—Don W. Zeigler.



Direct Sky Blue P-6B Extra Conc.
Chlorantine® Fast Blue P-BGLL
Chlorantine Fast Yellow P-5GLL
Direct Fast Scarlet P-4SWN
Direct Fast Orange P-WS
Direct Green BP
Direct Yellow P-CD
Chlorantine Fast Red P-5B Ex. Conc.
Chlorantine Fast Turquoise P-VLL

CIBA will be pleased to assist in formulating these products for your specific application.

CIBA offers a wide selection of dyes which are "paper-proved" for facial tissues . . . proved under all operating conditions and for fastness characteristics required for this use.

The brilliance and fastness to light of these direct dyes are outstanding . . . and their fastness to crocking and bleeding is excellent too.

Combining high tinctorial strengths and moderate prices per pound, these products bring important economy advantages to the dyeing of facial-grade tissues produced from bleached pulps.

The direct dyes listed at left are a selection of CIBA products recommended specifically for this application.

CIBA Company Inc., Paper Chemicals Department
627 Greenwich Street, New York 14, N. Y.

Louis Calder Marks 80th Year

Mr. Calder, president of Perkins-Goodwin Co., celebrated his 80th year March 9. He still finds "as much fascination in the complex daily workings of the pulp and paper industry as he did in his earliest associations with P-G."

In 1897 Mr. Calder began his Perkins-Goodwin career as an office boy. He later became a star salesman and in 1922 was named president. Prominent in the field of philanthropy, Mr. Calder's influence has been prominent in the areas of health and education through the Louis Calder Foundation. In addition to his position as president of Perkins-Goodwin, he is a director of Southland Paper Mills Inc., Lufkin, Texas, and heads Kesbec Inc., a service station chain.

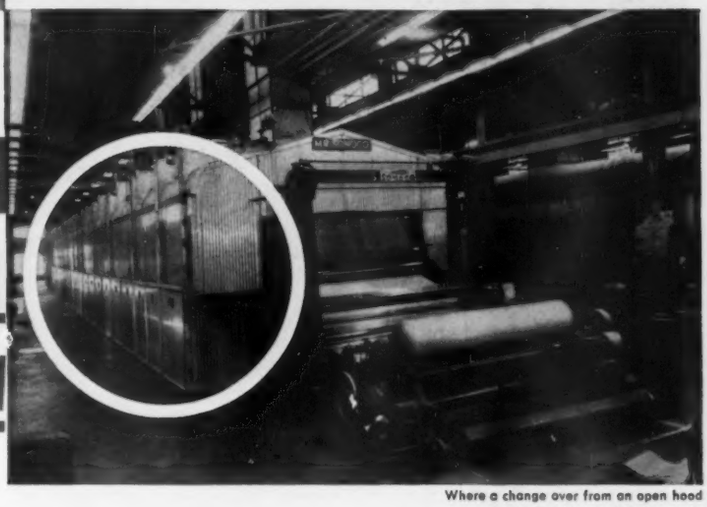
Goranson is Vice President; Lawrence Joins Cellulose Sales

ERIK GORANSON has been promoted to vice president, Cellulose Sales Co., New York, and L. WALTER LAWRENCE now represents Cellulose Sales in the Midwest U.S.A. Mr. Goranson has been with Cellulose Sales since 1952, has spent several years with the parent company (Svenska Cellulosa) in Sundsvall, Sweden and at several of the company's mills. Mr. Lawrence's experience in pulp dates back to 1943 (Soundview Pulp Co. which he represented until it was merged with Scott Paper Co.)

ROSS
Air Systems

Engineered Atmospheres for Better Processing

MODERNIZATION WILL PAY OFF!



Where a change over from an open hood to the Ross-Hooper Hood brought 7% savings in steam and 40% savings in air fan power requirements.

Substantial cost-reductions are possible in the modernization by:

Ross-Hooper Hoods

Briner Economizers and Waste Heat Recovery

Coaters and Drying

Air Distribution for Comfort

Distribution Units for Uniformity of Drying

Automatic Controls

High Velocity Air Drying

Obsolescence takes over with any piece of equipment the moment something better comes along. The question is where and when to start. While the date of installation is not necessarily a measure of obsolescence, an arbitrary number of years in service can be a starting point for a study.

We suggest five years.

Ask to have a Ross Paper Mill Engineer check over all items in your mill that pertain to the Ross specialty—'Engineered Atmospheres'—and see what savings would show up in a modernization program. His detailed plans and recommendations would be based on the same engineering skill which over the years has put Ross Units and Systems on most machines in the country.

M-R

THE MIDLAND-ROSS GROUP OF COMPLEMENTING SERVICES

J. O. Ross Engineering, New York
John Waldron Corporation, New Brunswick, N. J.
Andrews and Goodrich, Boston
Ross Engineering of Canada Limited, Montreal
Ross Midwest Fulton, Dayton
Hartig Extruders, Mountainside, N. J.
Carrier Ross Engineering Company, Ltd., England

J. O. ROSS ENGINEERING
Division of Midland-Ross Corporation

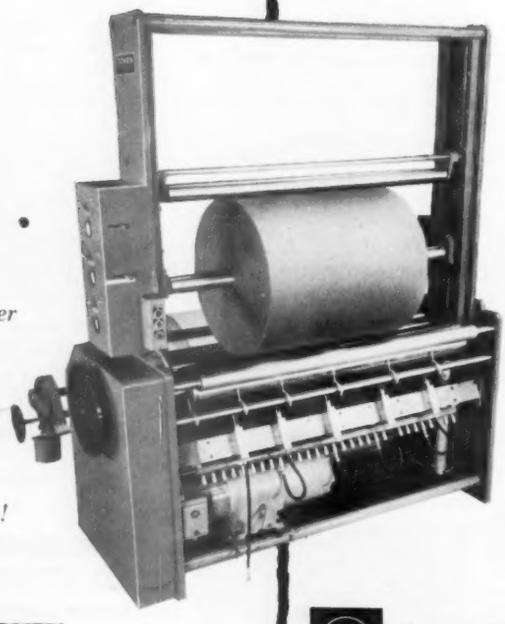
444 Madison Avenue, New York 22, N. Y.
ATLANTA • BOSTON • MT. PROSPECT, ILL.
DETROIT • LOS ANGELES • SEATTLE

The DRAPER Felt

DRAPER BROTHERS COMPANY
CANTON, MASS.

Sells for less . . .

. . . . than any other surface rewinder in its performance class!



DOVEN TWO DRUM REWINDER

• What's more, the Doven SR-60 two drum rewinder features powered feed rolls for "tacky" webs . . . A DOVEN EXCLUSIVE. Handles waxed, gummed or plain paper, paperboard, textile or rubber material to minimum of ½" slit. Furnished with score or shear slitters. Rider roll pneumatically raised and lowered.

Web sizes from 36" to 72"; takes parent rolls to 40" diameter. Optionals include parent roll capacity to 60" dia., choice of special backstand or unwind equipment, electric or mechanical drives.

Send us details of your application and samples for complete specifications and prices.

DOVEN DIVISION

APPLETON MACHINE COMPANY
APPLETON, WISCONSIN

Northeast

BERNHARD MAYER steps up to asst. director of research, Oxford Paper Co. He's a grad of State College of Forestry at Syracuse U., joined Oxford in 1950. . . . COLWYN HASKELL succeeds him as pulping group leader. He has a m.s. in chem engineering from the U. of Maine, joined Oxford in 1955.

CHARLES W. RICHARDS is now manager of International Paper Co.'s York Haven, Pa. mill, succeeding the late RALPH MASTER. Mr. Richards has a degree in chem engineering from M.I.T., joined IP in 1928 as chief chemist at the Rumford, Maine mill.

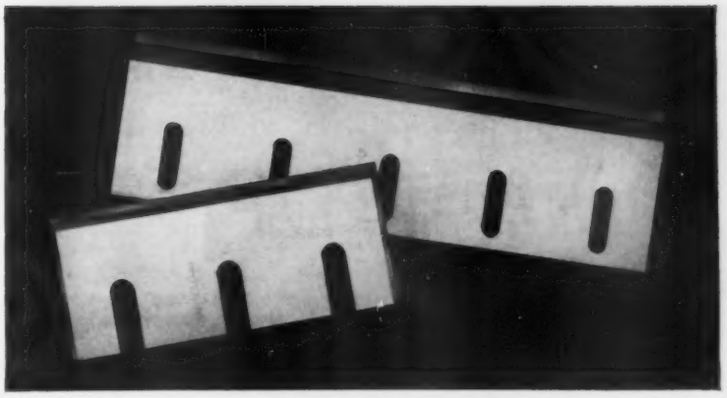
MICHAEL J. WALSH JR. moves along as traffic manager for St. Regis Paper Co. . . . JAMES J. FAY succeeds him as asst. traffic mgr. . . . GORDON C. INSKEEP is now administrative asst. to DR. KENNETH A. ARNOLD, technical director. He was asst. to the president of Processes Research Inc., associate editor of *Chemical and Engineering News;* production supervisor with Commercial Solvents Corp.,

Calvin A. King Elected Bird Machine President

. . . succeeding F. K. BECKER, who will continue on Bird Machine Co.'s board of directors and in a consulting capacity. Mr. King has been with Bird 13 years, in sales engineering, research and product development, later as assistant to the president and more recently as first vice president. He is a graduate chemical engineer from Northeastern University.

H. A. Stoess, Jr., Asst. Mgr., General Conveying Div., Fuller . .

. . . his promotion to this post in Fuller Co., Catasauqua, Pa., occurred recently. Mr. Stoess is widely known as an authority and speaker on materials handling problems. He has been with Fuller for 19 years. Born in Newark, N.J., he graduated from Columbia University.



QUALITY KNIVES FROM
HEPPENSTALL

HEPPENSTALL COMPANY
PITTSBURGH 1, PENNSYLVANIA
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PITTSBURGH BICENTENNIAL 1758-1958

DIE BLOCKS • FORGINGS • BACK-UP ROLL SLEEVES • RINGS
INDUSTRIAL KNIVES • MATERIALS HANDLING EQUIPMENT

PULP & PAPER

Strictly Personal

earned degrees at Ohio State and Institute of Paper Chemistry. St. Regis' central technical customers section, under GORDON L. BENSON, has realigned kraft paper and board technical service with MILTON R. ROBERTS as administrator of technical service to customers of kraft div.

WILLIAM B. BANKS, formerly administrative v.p., The Lord Baltimore Press, is now executive v.p., A. WILLIAM CHAPMAN becomes vice pres., and WILFRED L. COX, administrative sales mgr. and THOMAS W. ENGLERT joins the company as director of market research and new products. . . . JAMES A. MCKENNA is now administrative asst. to ALLAN R. WYLIE, sales promotion mgr. . . . ROBERT R. HOWARTH, exec. v.p., Columbia Box Board Mills, Inc., has been named to the National Defense Executive Reserve by the Forest Products Div., BDSA, U.S. Dept. of Commerce.

GEORGE A. LITTLEFIELD is now division mgr., Chemical Fine Paper and Board Division, Holyoke, Mass.), Standard Packaging Corp. He has been exec v.p. of Allied Paper Corp., and special asst. to the controller, St. Regis Paper Co. . . . CARL I. GOCHENOUR is now general mgr., product deevlopment and DR. THONET C. DAUPHINE moves into general economic development, Hooker Chemical Corp.

PHILIP K. MOONEY steps along as New York district sales mgr., Westvaco Mineral Products Division of FMC. . . . CHARLES E. LOWDEN joins the sales staff of American Cyanamid's pigments division in metropolitan New York. . . . A. T. CANHAM is sales engineer in the New York State area for Betz Laboratories, Inc.

BRYAN P. MCDONALD moves up as national sales mgr. for American Sisalkraft

GILBERT and NASH AIR OPERATED felt and wire guide

New . . . Simple . . . Compact.
Now operating on machines at speeds over 2,000 fpm, the Gilbert and Nash Air Guide reacts quickly with reliability and precision.

Although entirely air operated, this new guide *uses air only when a correction is made.* What's more, "swing roll" effect or guide roll oscillation is completely eliminated.

Guide roll is held stationary if air supply is interrupted . . . there are no springs to pull guide roll with possible damage or loss of wire or felt.

Complete standardization of *all* guides can be easily accomplished because the same model air guide is used for wires, wet and dryer felts.

We invite you to request for our representative to call.

Manufactured and sold exclusively by —

APPLETON MACHINE COMPANY
APPLETON • WISCONSIN

O. Glenn Leach, Exec.-Sec.
National Paper Trade Assn.

Mr. Leach was formerly with the National Automatic Merchandising Assn. as vice chairman of the management committee and was at one time mgr. of member, field and promotion services. He graduated with honors from Northwestern Univ., where he majored in marketing and sales administration. He succeeds retiring Exec.-Sec. Harry Londergan.

Slatin Grayson

In New APPA Posts

BENJAMIN SLATIN, vice president of The Econometric Institute, has joined the American Paper & Pulp Assn. as economist. He has worked on paper industry economics since 1946 when he joined Econometric.

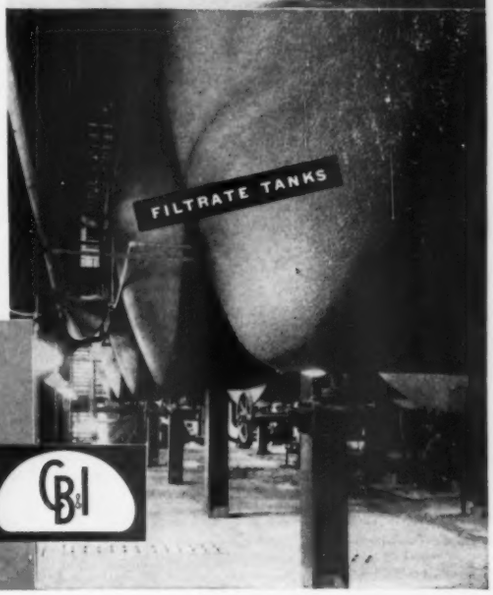
FREDERIC L. GRAYSON, associate economist, APPA, will represent the APPA on its Coordination of Research Committee and as secretary of the Controllers Committee. He continues as secretary of the Committee on Power and Water Resources and a new assisgnment is secretary of the Forest Industries Council.

CB&I **coordinated services employed in expansion at Jacksonville, Florida**

CB&I welded steel structures, ranging from chip storage tanks to digesters, played an important role in the expansion of St. Regis Paper Company's Jacksonville, Florida pulp, paper and board mill.

New pulping techniques *demand* the exacting attention to structural detail that is made possible by the advanced metallurgical controls and techniques employed by CB&I in the engineering, fabrication and erection of storage and process structures.

X-ray, stress relieving and welding techniques developed in almost seven decades of *craftsmanship in steel* insure CB&I customers of long, dependable service life. Expert, *one source* continuity through all phases of construction is the reason so many satisfied customers include CB&I again and again—when they consider expansion. Write our nearest office for bulletin: *CB&I Pulp and Paper Structures.*



Above: Digester building at Jacksonville, Florida shows arrangement of some of the CB&I-built structures at expanded St. Regis pulp, paper and board mill. Accumulator was erected by CB&I and furnished through Foster Wheeler Corp.

PP26

Chicago Bridge & Iron Company

Atlanta • Birmingham • Boston • Chicago • Cleveland • Detroit • Houston
New Orleans • New York • Philadelphia • Pittsburgh • Salt Lake City
San Francisco • Seattle • South Pasadena • Tulsa

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY, GREENVILLE, PA. and NEW CASTLE, DEL.

CB&I

PULP & PAPER

Strictly Personal

Corp. . . . DR. ELLIS ABRAMS and PAUL J. WELSH have been promoted to asst. mgrs. of reseach by E. F. Houghton & Co. . . . MR. & MRS. DICK TALBOT (R. T. VANDERBILT) have a second heiress, ANDREA LYNN.

WILLIAM H. KIEFFER and DR. CHARLES J. WEIDMANN have been elected vice presidents of the Ciba Co., Inc. Mr. Keiffer keeps his post as general sales mgr., dyes, joined Ciba in 1950 after working with Ciba Co. Ltd. in Montreal, and also with American Cyanamid. Dr. Weidmann continues as technical director; has a ph.d. from Switzerland.

DAVID L. LUKE, president, West Virginia Pulp and Paper Co. will keynote an all day session Apr. 14 for the pulp, paper and paper converting section of the Greater New York Safety Conference. JAMES E. JONES, American Paper & Pulp Assn., HERBERT S. JONES, Fitchburg Paper Co., will preside. Topics: "Costs of Accidents," by ROBERT HEITZMANN, National Council on Compensation; "Facts, Figures and Frustrations," by THOMAS J. CLELAND, Fibre Box Assn., and "Flow Charts on Accidents."—Maurice R. Castange.

Ober Bolton Huestis Max

Bolton Retires From Continental Can

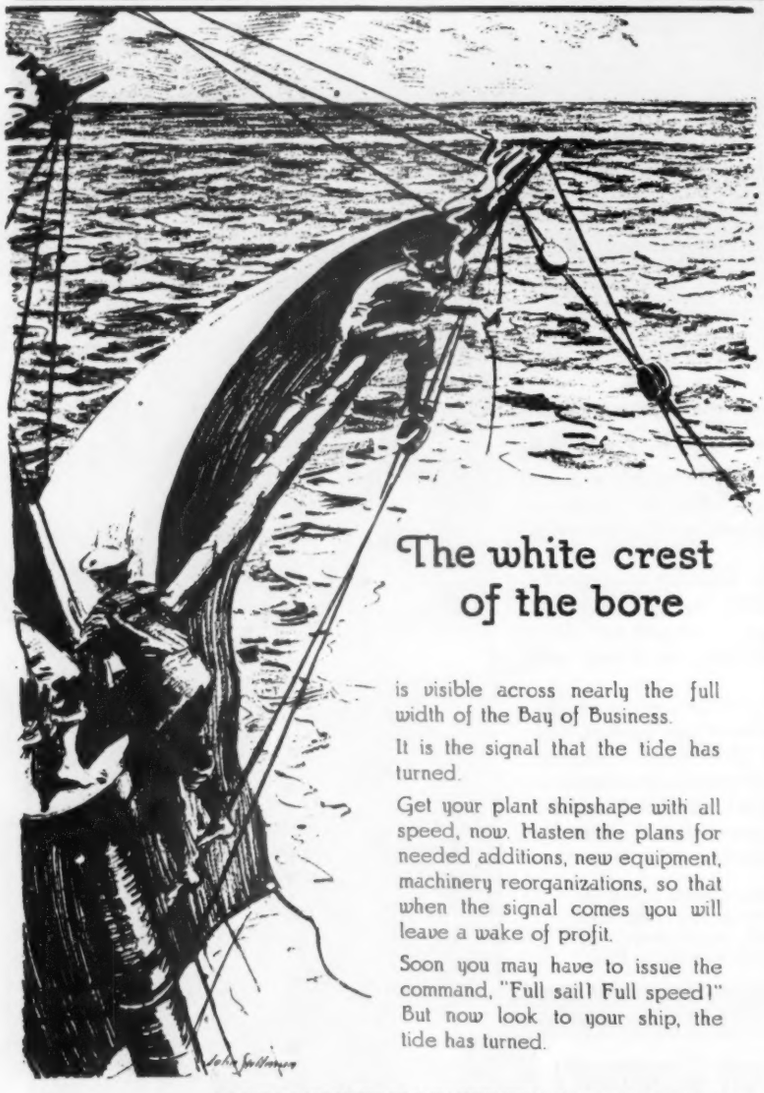
PHILIP S. BOLTON, technical and research director, Gair Products Division, Continental Can Co., retires this April and immediately leaves for a trip to Europe. Close friends honored him at a dinner. Shown above are some who attended. From left are J. L. OBER, retired vice pres., Scott Paper Co., Mr. Bolton, C. S. "BILL" HUESTIS, genl. mgr., Gair Paper Products Group of Continental and KEITH MAX, mgr. for research, engineering and development, Gair.

South

RAY F. CUYLE is new gen. supt. for Tennessee River Pulp & Paper Co. He was formerly production mgr. for the Hollingsworth & Whitney div. of Scott Paper Co., Mobile, Ala. In other appointments at the Tennessee firm, CECIL CARTER, formerly plant engineer for North Carolina Pulp Co., becomes plant engineer, and GEORGE O. GRIFFITH, asst. treas. of Ohio Boxboard Co., becomes comptroller and asst. treas. . . . MICHAEL L. YKASALA, chief accountant, is named district comptroller for St. Regis Paper Co. with offices in Jacksonville, Fla.

CHARLES A. MONTAGUE JR. has been named plant mgr. of the cellulose pulp operation of Buckeye Cellulose Corp., Memphis, Tenn. He was formerly resident engineer for the expansion project at Foley, Fla. Mr. Montague succeeds P. S. MOORE JR., who has been transferred to a management position at Charmin Paper Products Co., Green Bay, Wis. (Both Buckeye and Charmin are wholly-owned subsidiaries of Procter & Gamble Co.). . . . WILLIAM A. KEISS JR. and WILLIAM S. SCHILLHAHN have been appointed gen. mgr. and plant mgr. respectively of Container Corp. of America's Chattanooga, Tenn. paperboard mill. Mr. Keiss has been Chattanooga sales mgr. since April 1958, while Mr. Schillhahn was formerly plant controller.

PAUL E. CRAFTON is res. engineer in Atlanta, Ga., for American SF Products Inc. He was formerly with F. J. Evans Engineering Co., Atlanta. . . . BEN VOLKER opens the Jacksonville, Fla. office of Fischer & Porter Co. He was formerly an F&P product application engineer.



The white crest of the bore

is visible across nearly the full width of the Bay of Business.

It is the signal that the tide has turned.

Get your plant shipshape with all speed, now. Hasten the plans for needed additions, new equipment, machinery reorganizations, so that when the signal comes you will leave a wake of profit.

Soon you may have to issue the command, "Full sail! Full speed!" But now look to your ship, the tide has turned.

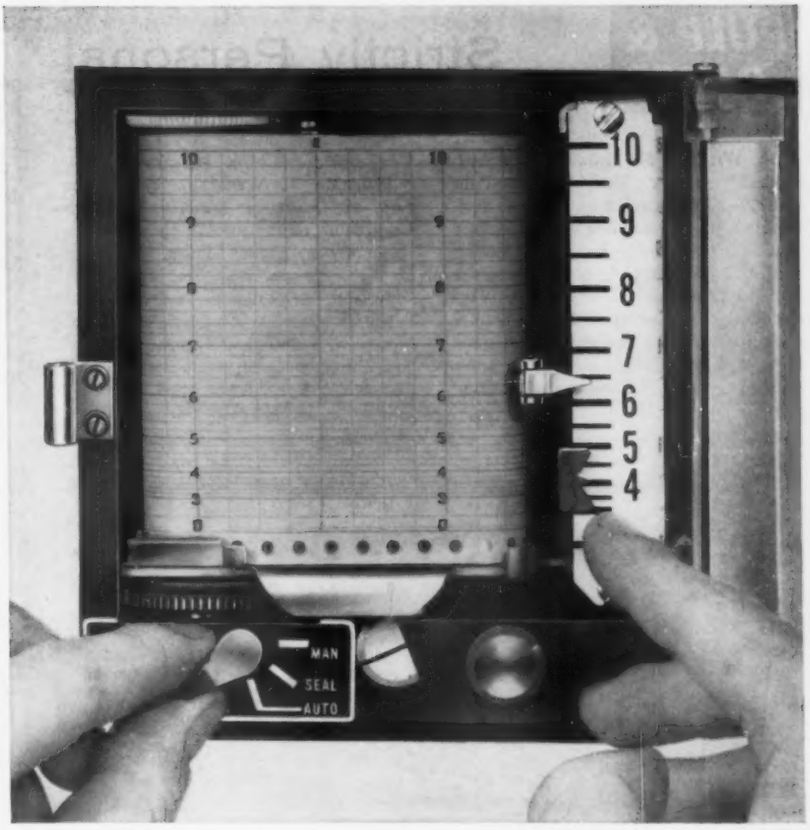
THIS MESSAGE IS REPEATED FROM OUR AD OF A QUARTER CENTURY AGO—AND IS EQUALLY IMPORTANT TODAY. AGAIN, THE TIDE HAS TURNED—IS YOUR PLANT SHIPSHAPE TO MOVE AHEAD SWIFTLY WITH THE INCREASING FLOW?

J. E. SIRRINE COMPANY · Greenville, South Carolina

Engineers Since 1902

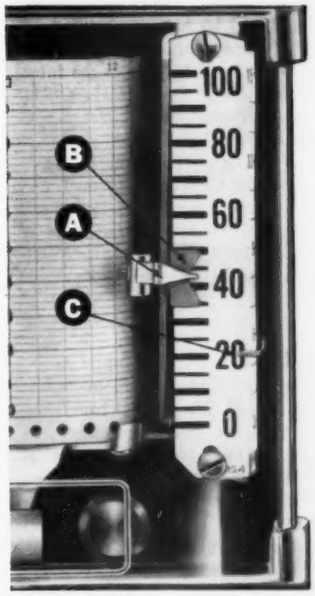
A DEPARTMENTALIZED ENGINEERING ORGANIZATION SERVING · BUSINESS · COMMERCE · INDUSTRY

One of 38 Metagraphic Receiver Models you can choose from, all with only 5" x 5⅛" panel. This model has single-knob, six-position transfer station for completely "bumpless transfer" in cascaded control systems.



BRISTOL METAGRAPHIC RECEIVERS:

"Easiest 'bumpless transfer' you ever saw"



Variable (A), set point (B), and valve position (C), all on same scale, make manual-automatic transfer easy.

That's what instrument men say after trying the Bristol Metagraphic Pneumatic Receiver—even in cascade control systems.

Just seal, match pointers, transfer. There's not a single value to read. That's because the Metagraphic gives you valve position, set point and measured variable *—all on the same scale.*

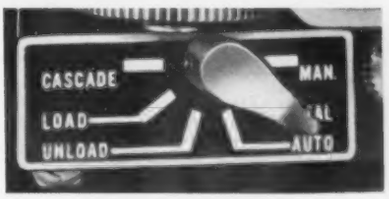
No finger-disconnects here! The Metagraphic is a true plug-in receiver—plugs and unplugs in 5 seconds with no loss of automatic control.

You can switch from indicator to recorder in less than 10 seconds, interchange many receiver models, change range simply by changing chart. Cuts down on costly reinstallations if process requirements are changed.

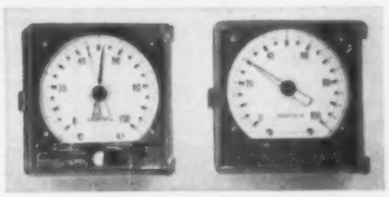
Write today for the complete Metagraphic story. Don't forget, Bristol offers the widest selection of miniatures on the market. (Full sized instruments, too.) The Bristol Company, 142 Bristol Road, Waterbury 20, Conn. B-18

BRISTOL TRAIL-BLAZERS IN PROCESS AUTOMATION

AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS



Six-position transfer station (enlarged view) for cascade service. Three-position manual-automatic station is also available.



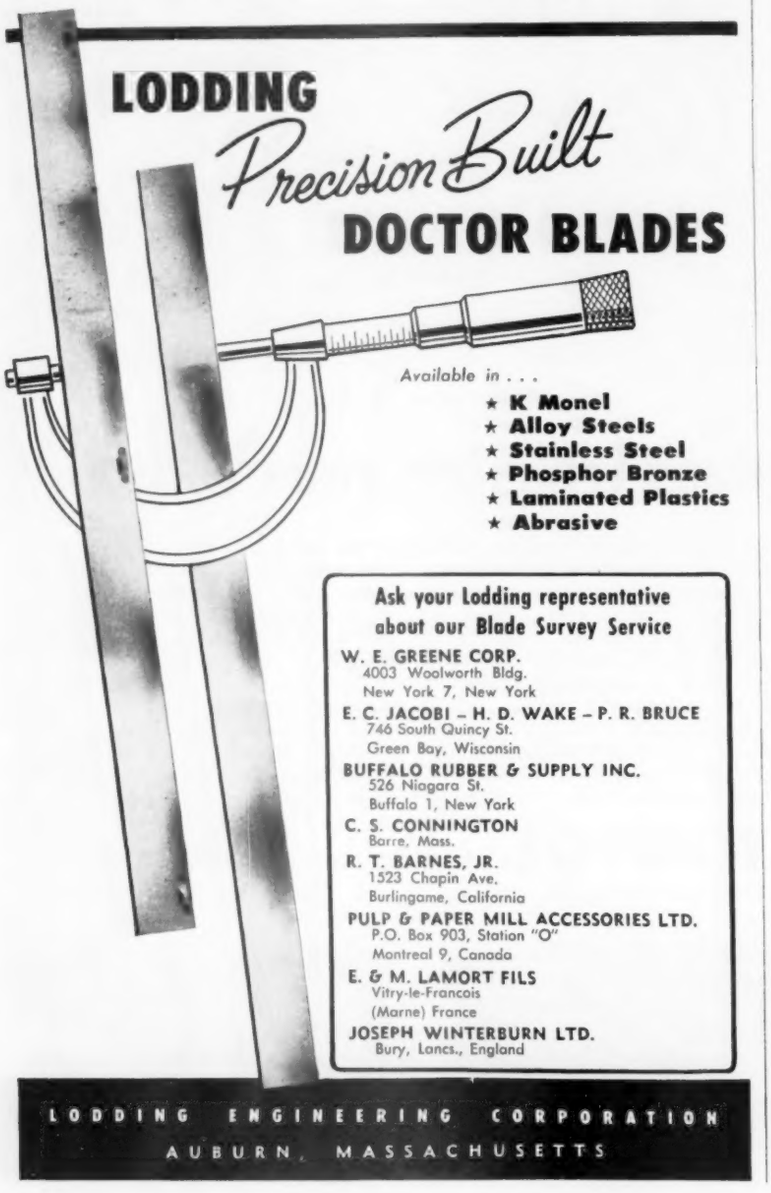
Metagraphic Indicating Receivers have full 9-inch scale for easy reading; feature complete 10-second interchangeability with recorders.

PULP & PAPER Strictly Personal

DR. WILLIAM D. MAJOR is now asst. technical director, West Virginia Pulp and Paper Co's. Covington, Va. mill. Previously a project engineer with Container Corp. of America in Brewton, Ala., he earned degrees at Colgate and Institute of Paper Chemistry. . . . KURT O. WASSEN moves into new post of commercial supt. at Covington. An engineering grad of Layfayette College, also m.b.a. from Harvard School of Business Administration.—William F. Diehl.

Webster Joins H. K. Ferguson

WILLIAM T. WEBSTER, former vice pres. in charge of National Container Corp. mills, retired recently from the successor owner, Owens-Illinois, has joined H. K. Ferguson Co., Ferguson Bldg., Cleveland, O., as director of its Pulp and Paper Division. The Ferguson Co. is concerned with design and construction of mills throughout the world. Mr. Webster will continue residence at 4215 Great Oaks Lane, Jacksonville, Fla.



Pacific

Appointment of JACK L. DAVIES to the post of director of market planning has been reported by Fibreboard Paper Products Corp., San Francisco. Prior to his appointment he was with McKinsey & Co. Inc. in San Francisco. . . . W. W. CLARKE, director and asst. mill mgr. for Longview Fibre Co., is attending the advance management program at the Harvard Graduate School of Business Administration. . . . GEORGE CHARTERS, project engineer at Crown Zellerbach central engineering in Seattle, transfers to the Western-Waxide div. at Orange, Texas, as supt. He replaces HARRY M. GARDINER JR., who becomes Western-Waxide supt. at San Leandro, Cal.

LYLE W. BALDWIN, machine tender since 1954, becomes shift supervisor at the Everett, Wash. mill of Scott Paper Co.'s West Coast div. . . . Shell Chemical Corp. announces initial production at its market development unit at Martinez, Cal. The first run included several derivatives of acrolein. The unit is designed to produce semi-scale quantities of industrial chemicals. . . . JAMES L. TODD, with more than 25 years' experience in pulp and paper chemicals, becomes western sales mgr. for Petrochemicals Co. ABE GOLDHAAR was named director of technical services. . . . Western regional sales headquarters of the Alloy Tube div. of Carpenter Steel Co. has been moved from San Francisco to San Marino, Los Angeles. Manager is HARRY L. HARNER. — Louis H. Blackerby.

J. J. Herb, Founder of West Coast Mills, Dies

JOHN JACOB HERB, pioneer pulp-maker and the founder of Westminster Paper Co., New Westminster, B.C., and Pacific Coast Paper Mills, Bellingham, Wash., died March 1 at his home in Bellingham, aged 85. Wisconsin-born, he went to Canada in 1912 and help build the Interlake Tissue Mills at St. Catharines, Ont. Going to the Pacific coast, he organized the mills at New Westminster and Bellingham which were subsequently managed by two sons, the late ELMER J. and FRANCIS J., respectively. Several years ago the Bellingham mill became a division of Puget Sound Pulp & Timber Co. Westminster is closely affiliated with Scott Paper Co.

Canada

W. C. R. JONES, vice president, public relations, Powell River Co., has taken over some of the duties formerly performed by LEANDER MANLEY and KINGSLEY HARRIS at the Vancouver, B.C., office of the Western Branch, Canadian Pulp & Paper Association. The office was closed down at the beginning of the year.

F. D. TAYLOR, who directed construction operations for St. Lawrence Corp. at Red Rock, Ont., and managed that division for several years before going to

DRAMATIC MOMENTS IN PAPER-MAKING PROGRESS

Aubrey Crabtree, President of Fraser Paper, Ltd., and Mill Manager J.W.D. Hierlihy are shown here "center stage" in one of the paper industry's most exciting events—the first run of a newly rebuilt machine. In their hands is paper produced by their Fourdrinier machine, which was completely rebuilt by Pusey and Jones and is now in service at Fraser's Madawaska, Maine, mill.

It has a completely new Fourdrinier, a 228" wire width, 100' 0" wire length, 2000 fpm speed, and was preassembled at the Pusey and Jones plant for faster installation and on-time start-up. A vacuum pickup arrangement and an after-dryer section with completely enclosed gearing were added.

Pusey and Jones, the first company in the United States to specialize in the manufacture of paper-making machinery, continues to pioneer with such developments as the Automatic Air Guide System® and a new Differential Hydraulic Drive. May we help you with a complete machine or a component specially designed for your needs?

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Strictly Personal

the East Angus mill, is now with Richmond Pulp & Paper Co. of Canada at Bromptonville, Que.

B. W. POWER has been appointed vice president, manufacturing, the E. B. Eddy Co., Hull, Que. and he is also chairman of the company's finance committee. He was formerly vice president, finance. . . . New manager of manufacturing for KVP Co. at Espanola, Ont., is J. F. McCALLUM. For the past nine years he was resident engineer.

WILLIAM W. HALL, formerly technical section engineer CPPA has been made control engineer, Gaspesia Sulphite Co., Chandler, Que.

ALBERT ROLLAND, formerly general sales mgr., Rolland Paper Co., Que., has been elected vice president and director of sales, succeeding ROY H. ECCLESTONE, who retired at the end of 1958, although he continues as a director of the company.

RIELLE THOMSON, public relations chief for Canadian Pulp & Paper Association in Montreal, paid his first visit in years to the Pacific coast in February, attended the official opening of the new Forest Products Laboratory in Vancouver and addressed a banquet of the University of British Columbia Forestry Club.

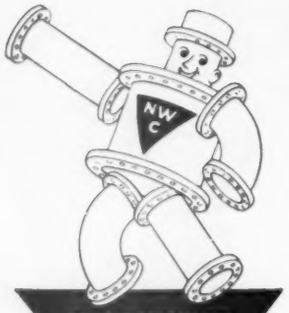
ALEC HAMILTON has succeeded G. J. LANE as manager of Quebec North Shore Paper Co. Baie Comeau, although Mr. Lane continues as consultant to the company . . . W. G. JAMES has been chosen as assistant to the president of St. Lawrence Corp., P. M. FOX. . . . PETER LIVINGSTON is acting manager of the KVP Co., Espanola, Ont.—Charles L. Shaw.

Who Will Succeed Sloan?

An historic and sometimes controversial era in British Columbia's forestry industry ended Jan. 13 with the death, at 60, of GORDON SLOAN, following a heart attack. Mr. Sloan, formerly chief justice of the province and a public figure of outstanding capacity and enormous prestige, had been serving as special advisor on forestry to the B.C. government at a salary of $50,000 a year.

Whether the government will try to replace a man of such unique qualifications as Mr. Sloan or, instead adopt some other modified procedure in dealing with forestry affairs, has yet to be determined. Following a meteoric career in politics, Mr. Sloan was appointed a judge and became the youngest chief justice in B.C.'s history. The Sloan reports laid the foundation for B.C.'s forest management license, or tree farm, system based on the sustained yield principle, and this in turn stimulated the area's greatest expansion in pulp and paper.

CUSTOM FABRICATIONS



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AT 4-2191

Pulpwood

P. V. LEMAY, woods mgr. for Marathon Corp. of Canada Ltd., has been re-elected president of the Northwestern Ontario Timber Operators' Assn. Named to the post of vice pres. was J. H. MERRILL, vice pres. for woodlands of Great Lakes Paper Co. Ltd. . . . . J. D. OLLSEN, chief logging accountant in Crow Zellerbach Corp.'s northwest timber dept., Portland, Ore., is named dept. controller, he is succeeded by R. F. URQUART. . . . R. V. MILES JR., forestry mgr. for Gulf States Paper Corp., is Alabama state chairman of the Pilot Forest project—a southwide forest development program sponsored by the Southern Pulpwood Conservation Assn.

ROSS R. DOUGLAS, mgr. of the woods div., becomes vice pres. of forestry operations for Alaska Pine and Cellulose Ltd. . . . ROBERT DELONG, asst. to the gen. mgr. of the logging and forestry dept. of St. Regis Paper Co., Tacoma, Wash., succeeds DAVE JAMES of Simpson Logging Co. as chairman of the Washington State committee of American Forest Products Industries Inc. . . . DALE PRENTICE, formerly Western Pine Assn. forester at Redding, Cal., joins the Southern Oregon Conservation & Tree Farm Assn., Medford.

Assistant Pulp Mill Superintendent Arthur Hicks inspects one of five Stainless Steel flat screens in the wet room.

Stainless Steel equipment works 24-hour day... still in good condition after five years

AT D. M. BARE PAPER CO., ROARING SPRING, PENNA.

"I wouldn't describe Stainless Steel as the best material for much of our equipment. I'd go further than that—Stainless Steel is the *only* material that we can logically use," says Mr. Arthur Hicks, Assistant Pulp Superintendent at D. M. Bare Paper Co.

"We paid a little more to install Stainless Steel when our pulp mill opened back in 1954. But now, looking back, we actually saved money because we haven't had to replace the Stainless as we've had to do with other materials. The corrosion resistance, abrasion resistance and strength of Stainless Steel add many years of trouble-free service life. Our Swenson evaporator is a good example. We installed it several years ago to recover chemicals from cooking liquor. Part of the tubing that *was not* Stainless Steel corroded and had to be replaced. The Stainless hasn't been damaged.

"We installed a lot of Stainless Steel in our bleaching equipment because here, too, we use highly corrosive solutions—acids, chlorine and hydrated lime. This equipment has been working a 24-hour day for five years now, and it's still in excellent condition – better than we had even hoped for."

Build and repair your equipment with Stainless Steel. USS Stainless Steel is available through your U.S. Steel representative or your local Steel Service Center.

USS is a registered trademark

United States Steel Corporation – Pittsburgh
American Steel & Wire – Cleveland
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USS

WESTERN WAYS INC. photo

100,000 TONS OF PULP CHIPS

have been stockpiled at the new Georgia Pacific paper mill at Toledo, Oregon, with a Rader high pressure pneumatic conveying system. More than 2 tons per minute are blown from a rail car unloading pit to a tower 550 feet away, then to all corners of the pile through use of portable pipe sections. Another Rader system has recently been installed at Toledo, blowing chips 2,200 feet across the bay in the background, from Georgia Pacific's sawmill directly to the storage pile.

Write today for complete information about Rader systems.

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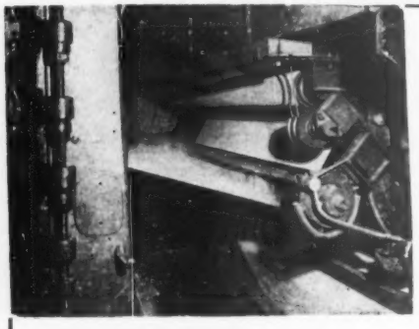

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- **WET END—breaks up bubbles, disperses foam**
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CHEMICALS

Glidden to Build Lab

The Chemical-Pigments-Metals div. of Glidden Co. will construct a $1,000,000 Inorganic Research & Development Center at Baltimore, Md. The Cleveland-based company will locate on the site of the Adrian Joyce works—one of the nation's largest titanium dioxide manufacturing facilities—a laboratory that will consolidate all activities in connection with inorganic chemical research, product development and technical service. According to George M. Halsey, div. vice pres., "Glidden believes that one of the most promising potential markets for titanium dioxide lies in the papermaking industry, and this laboratory will be equipped with papermaking and coating facilities to develop pigments of superior quality for these end-uses." Operation is set for September.

Infilco Leasing Plan

A comprehensive plan for leasing water-, sewage- and waste-treating equipment, with option to purchase, has been announced by Infilco Inc. The plan can be applied to many equipment types and sizes. Write Infilco at Tucson, Ariz.

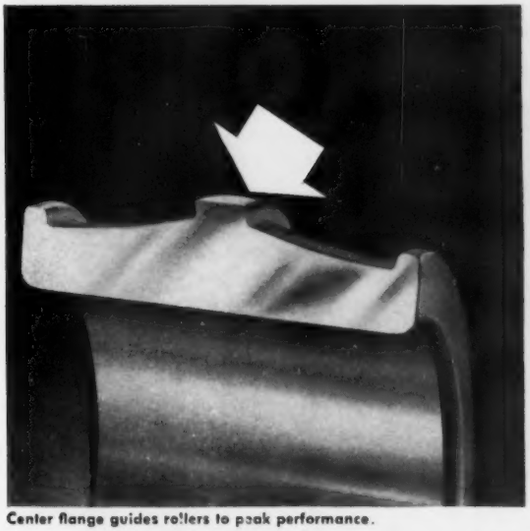
Meet Huyck's

McLAUGHLIN

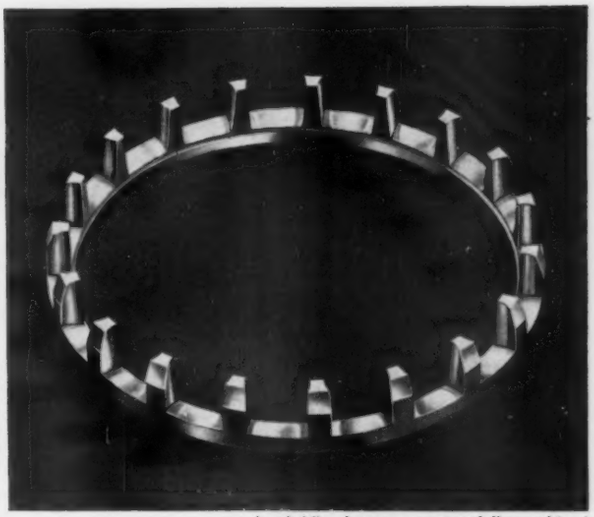
William J. McLaughlin, more often called Bill, is Project Manager of Huyck's Needled Felt Development Section. He attended Siena College and during the past 12 years has given yeoman service in research, development, design and manufacturing at Huyck's. Bill and his group conduct an extensive and continuing study of felts for asbestos shingle and pipe operations and other related uses. Object: To maintain Huyck's leadership in this important phase of felt manufacture.

HUYCK FELTS

First in Quality . . . First in Service Since 1870

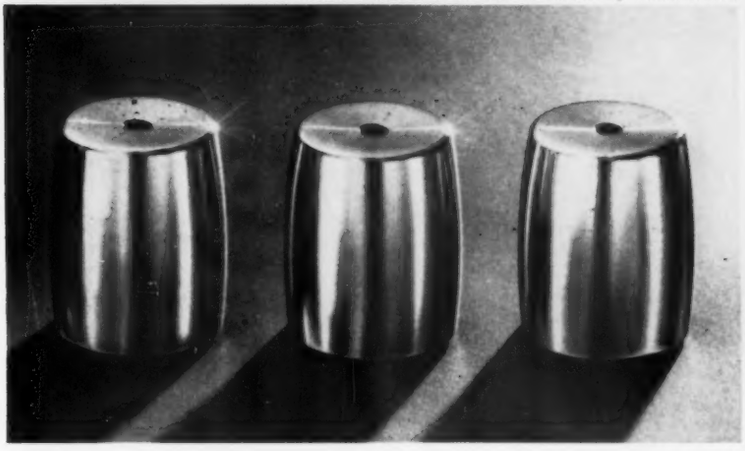


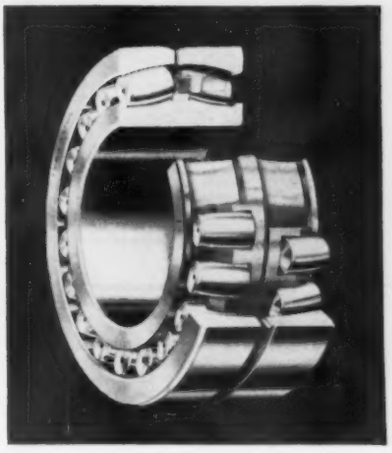
Center flange guides rollers to peak performance.



Land-riding bronze cages are fully machined.

Roller diameters are matched electronically within .0001".





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Torrington has compromised none of the operating design features of its Spherical Roller Bearing, because application experience has proved them essential to superior bearing performance.

There's no substitute for the stabilizing effect of the integral center guide flange. Torrington's asymmetrical roller seeks this flange under load. Skewing and stress concentrations are eliminated. Every roller carries its share of the load, for roller diameters are matched electronically within .0001" for even load distribution.

Rollers are precisely spaced by fully machined land-riding bronze cages that withstand even the high stresses of eccentric service. Two independent cages, one for each row, prevent roller drag and side stresses under thrust loads. Size-stabilized races prevent "growth" or change in dimension in service.

These features mean a cooler-running, longer-lasting bearing. When you buy bearings, look into *every* detail, and you'll choose Torrington. **The Torrington Company, South Bend 21, Ind.—and Torrington, Conn.**

Superior performance features of TORRINGTON SPHERICAL ROLLER BEARINGS:

- Integral guide flange for roller stability
- Asymmetrical rollers seek flange for positive guidance
- Electronically matched rollers
- Size-stabilized races
- Fully machined land-riding bronze cages
- Controlled internal clearances
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STARCHES ...for every Paper Mill Operation!

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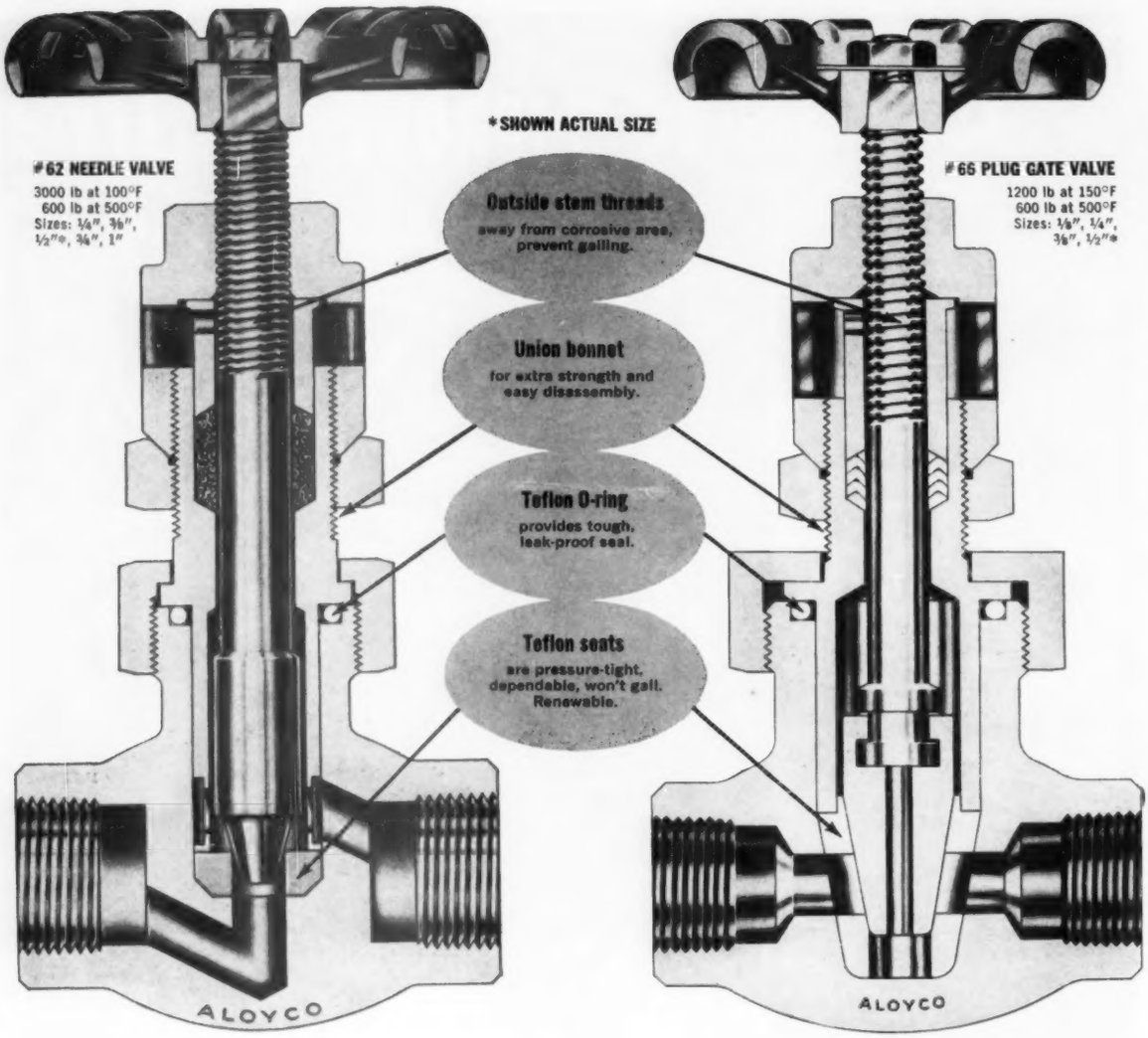


radically different ALOYCO Stainless Steel Valves eliminate leakage and galling common to ordinary fine control valves

Introduced eight years ago, these two small Aloyco valves have proved themselves in many types of severe corrosive service as well as handling hard-to-hold fluids and high-pressure gases.

The No. 62 Needle Valve (left) is particularly suitable for sensitive control of flow . . . as in metering or sampling for process plant, laboratory or pilot plant use.

The No. 66 Gate Valve has a vented, full-floating plug disc, which exerts no twisting action on the removable Teflon seat in closing. It is ideal for instrument lines, in small lines handling viscous liquids, or where a low pressure drop is important.

For more facts write to Alloy Steel Products Company 1316 West Elizabeth Avenue, Linden, New Jersey...the one manufacturer specializing in Stainless Steel Valves exclusively.

9.4

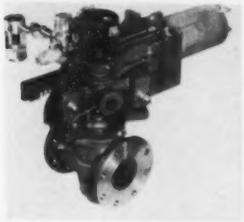
ALLOY STEEL PRODUCTS COMPANY LINDEN, N. J.

Boston · New York · Wilmington · Atlanta · Buffalo · Pittsburgh · Chicago · St. Louis · San Francisco · Los Angeles

New Equipment Section

Basis Weight Control Valve

. . . Eliminates Air Entrainment



Applications: The electric-hydraulic unit is especially applicable for use with a beta gauge for automatic basis weight control.

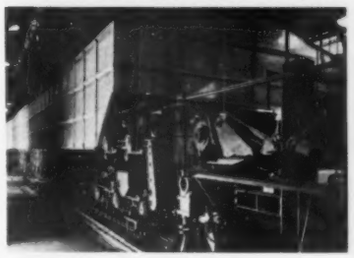
Advantages: Since the system is always full of stock, a major source of air entrainment is eliminated. According to the manufacturer, the machine tender can change the basis weight without leaving his station. Because the valve is installed at a much lower level in the system than a conventional stuff gate, any changes in the stock level at the stuff box will have a much reduced effect on the amount of stock delivered. The result, says the supplier, is more uniform basis weight.

Specifications: The unit consists of a DeZurik vee-port stock throttling valve, a cylinder actuator, solenoid valves and a precision position transmitter. Suitable control stations and position recorder can be furnished to provide accurate control and read out. A hydraulic cylinder assures "absolutely positive control due to the relative incompressibility of water. Two three-way solenoid pilots are manifold-mounted on the actuator and piped to the cylinder. The pilots have a plug-in feature so that either pilot can be replaced by simply removing two bolts, lifting the valve off the manifold and bolting a new pilot in place. A precision electric position transmitter is mounted on the actuator and connected to the valve plug to show exact valve position. The transmitter has a 0 to 50,000-ohm slide wire with a maximum rating of 400 v across the full coil. A manual control station can be furnished. It has a vernier 10-turn counter dial with 1,000 divisions and can be set to half a division.

Supplier: **DeZurik Corp., Sartell, Minn., Tel: BLackburn 1-0221 (St. Cloud).**

Fiberglass Machine Hood

. . . Withstands Severe Impacts



Applications: For moisture removal and maximum circulation for ventilation and drying.

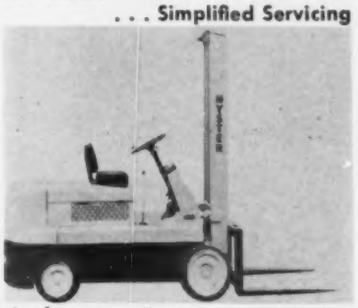
Advantages: According to Corrosion Controllers Inc., its light weight makes the hood easier and more economical to install, and the polyester fiberglass is able to withstand severe impacts. With increased resistance to corrosion, the hood is said to outlive other materials. Listed as fire retardant, it is translucent, and the light thus provided makes work on the machine easier and safer.

Specifications: The hood is custom designed to individual building and machine layout, roof characteristics, available steam pressure and power current.

Supplier (Distributor): **Mead Pulp Sales Inc., 118 W. First St., Dayton 2, O., Adams 8141.**

Lift Truck

. . . Simplified Servicing



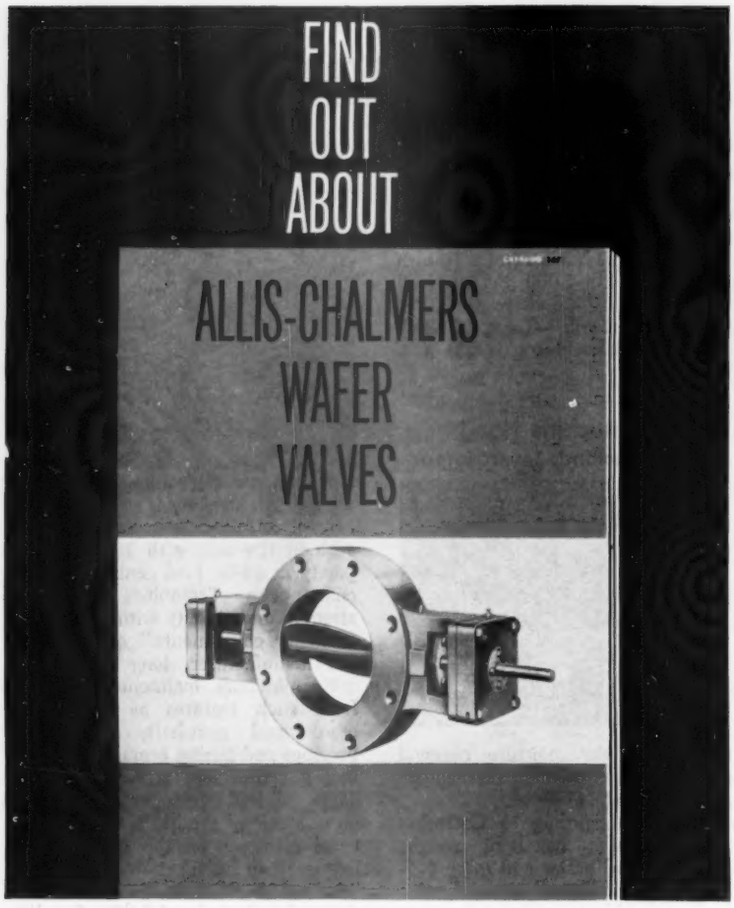
Applications: For storage operations where high stacking is required.

Advantages: The SpaceSaver 100 is a cushion tire unit with 10,000-lb. capacity at 24-in. load center. Unitized construction "combines maximum strength and rigidity with easy access to major components." According to the manufacturer, long service life with minimum maintenance, results from such features as extra-heavy crank and camshaft, heat-treated bearings and timing gears, built-in flyball governor and sturdy gear case cover. All fuel components are placed on one side of the block and all electrical elements on the other. Other features include: power steering, "shortest turning radius in the industry," full circle visibility, fast lift, travel speed, high maneuverability.

Specifications: The unit is available with standard two-speed, constant-mesh transmission on the optional power shift Hystamatic transmission. Options include free-lift uprights, extra-wide apron, optional tilt angles and a full range of attachments and accessories. The Continental 83-hp. engine has a 244-cu. in. displacement and develops 192-lb. ft. torque at 1,200 rpm.

Supplier: **Hyster Co., 1003 Myers St., Danville, Ill., U. S. A.**

Knox Felts
KNOX WOOLEN COMPANY
CAMDEN, MAINE
America's First Manufacturer of Endless Paper Machine Felts



You get rugged, high-quality wafer valves with this new, full-bodied design

Here's a new wafer valve that offers many of the highly desirable features of two-flanged butterfly valves. Allis-Chalmers full-bodied design gives you a sturdy valve that will stand up to the toughest service conditions, but with the flexibility to fit almost any type of operation.

New A-C Wafer Valves are available in a variety of alloys to handle fluids or semi-solids over a wide temperature and pressure range. Full rubber seats will afford maximum body protection and positive, bubble-tight shutoff. They can be equipped with almost any operator.

To obtain complete information on these new, full-bodied wafer valves, send for a free copy of this new catalog. It gives you full dimension data on both metal- and rubber-seated types, as well as operators and positioners, lists standard materials and modifications, and contains engineering data specially prepared to help you select and size this new wafer valve design. It is available through your nearest A-C Valve representative, or you may write to Allis-Chalmers, Hydraulic Division, York, Penna.

Hydraulic Division RESEARCH | DESIGN | HYDRODYNAMICS | ENGINEERING | FABRICATION

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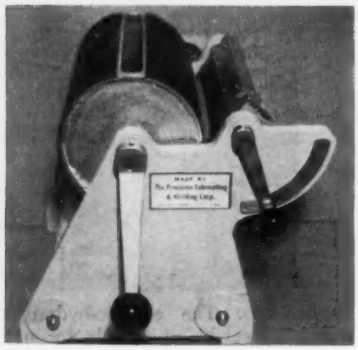
A-C ALLIS-CHALMERS

ALLIS-CHALMERS

New Equipment

Lab Trailing Blade Coater

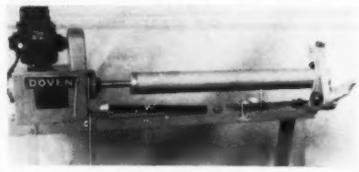
. . . One-Man Operation



Applications: For checking out new coating formulations on existing base stock; for testing the effect of standard coating on a variety of paper and board base stocks; for evaluating the effect of varying solids content, adhesives, pigments and double coating.
Advantages: The coater is said to be simple to set up and can be operated by one man. It uses a minimum of coating and is easy to clean up. Coating weight may be varied between ½ and 10 lbs. per ream by varying solids and adjusting the pressure to a rubber back-up tube located under the coating blade.
Specifications: Developed by Time Inc., the unit tests coated sheets measuring 6½ × 11 in. The 50-lb. coater is 13 in. high and 14 in. wide. Test sheets may be checked for coating holdout and coverage by viewing under a black light. Improvement in print quality due to blade coating is determined by proof printing on a Vandercook or similar press.
Supplier: **Precision Fabricating & Welding Corp., 3 Grassy Plains St., Bethel, Conn., Tel: 8-6250.**

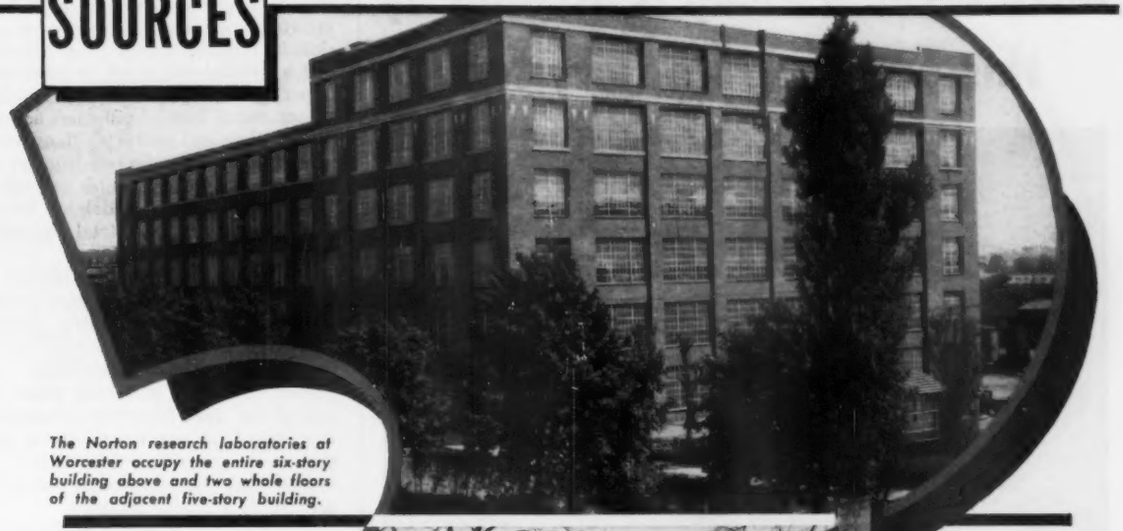
Portable Core Cutter

. . . for Various Sizes, Diameters



Applications: For slicing tubes into a variety of core lengths.
Advantages: The standard model can handle cores of 1 to 8 in. inside dia. and can slice them into ½-in. widths using tubes of up to 80 in. in length. Larger and smaller units are available. Prices start at $425,000.
Supplier: **Appleton Machine Co., Doven Div., Appleton, Wis., U. S. A.**

TWO SOURCES for RESEARCH . . . for SUPPLY!



The Norton research laboratories at Worcester occupy the entire six-story building above and two whole floors of the adjacent five-story building.

The Norton research laboratories building at the Chippawa, Ontario electric furnace plant.

But only ONE standard of Quality and Service for You

In Norton Company laboratories, both in Worcester and in Chippawa, Ontario, more than 185 research men and technicians are constantly at work applying a wide variety of highly specialized knowledge to the development of better abrasives, pulpstones, grinding wheels, and other Norton products.

From the Norton manufacturing plants at Worcester and at Hamilton, Ontario, hundreds of pulpstones go out each year to meet the world's requirements for mechanical pulp.

Thus users of Norton pulpstones have the benefit of research developments from two major sources — are served by two completely independent sources of manufacture — both with one high standard of quality and service.

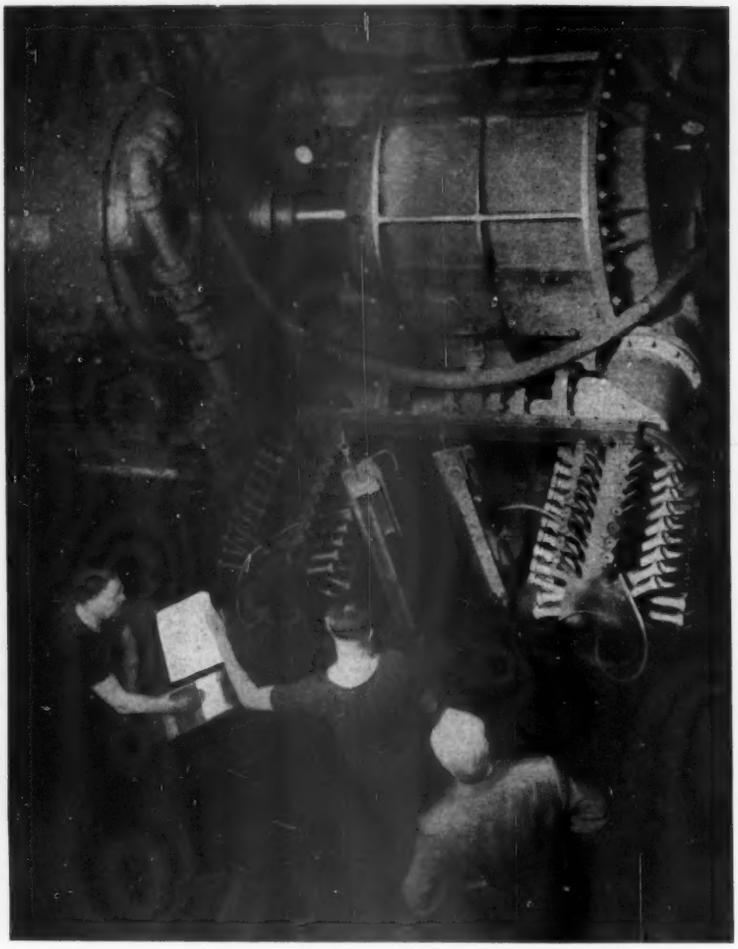
NORTON COMPANY, WORCESTER 6, MASS.
Norton Company of Canada Ltd., Hamilton, Ont.
EXPORT: Norton Behr-Manning Overseas Inc., Worcester 6, Mass.

NORTON
PULPSTONES

Abrasives - Grinding Wheels - Grinding and Lapping Machines Refractories - Electrochemicals - Non-slip Floors | Norbide Products

Making better products . . . to make your products better

Rated performance of every Nash Vacuum Pump is assured by this precise laboratory test



Rated capacities of Nash Vacuum Pumps are not theoretical. Every Nash Pump is tested individually. Air capacity is determined by delivery thru accurately machined and calibrated orifices. Related vacuum is measured by precise mercury column, and horse power is recorded electro-dynamically. Records of these tests are retained by us, and certified copies are available to Nash Pump owners.

That is one of the reasons why Nash Vacuum Pumps are installed in over a thousand leading Paper Mills. An engineer from Nash will be glad to survey your mill, and make recommendations, entirely without obligation to you.

NASH ENGINEERING COMPANY

440 WILSON ROAD, SO. NORWALK, CONN.

Scott Expands Research; Starts Fiber Study in Appleton

Scott Paper Co.'s Chemical Research Dept. comprising approximately 90 persons is one of the fastest growing and most progressive of industrial research organizations. In addition to extensive work in pulp and paper technology, it is engaged in development of foamed polymers and of plastic films and coatings. Plans have been approved for the construction of a new Scott research center and office building near the Philadelphia International Airport with total expenditure of about $10,000,000.

Meanwhile, Scott has established a post graduate research position at the Institute of Paper Chemistry, Appleton, Wis. The objective will be to increase the basic knowledge of fibrous structures of which paper is one of the most important examples. No immediate commercial goals are part of the program but Scott is convinced that the knowledge obtained will be of value to industry.

Although paper is one of the most common products of our economy, there is much about it that defies explanation. With the natural cellulose fibers hydrogen bonding between hydroxyl groups of neighboring fibers brought into close proximity is considered to account for the interfiber attachment. There have been some recent examples of interesting changes brought about in this bonding by chemical means. Scott feels the time is ripe for significant advances in this area.

The work at Appleton will be under direct supervision of the staff of the institute with active collaboration of Scott's Chemical Research Department and the person receiving the appointment will be a member of that department. It is hoped that he will later join the Scott research staff at Chester, Pa., but there is no obligation to do so.

Novel Training Session At Nekoosa-Edwards

Nekoosa-Edwards Paper Co., Port Edwards, Wis., is laying plans for a two weeks session beginning May 11 for trainees in paper merchant companies which is believed the first such training course of its kind.

Fundamentals of papermaking, printing and salesmanship will be taught. Sixteen trainees will be selected from wholesaling companies all over the U.S.A.

Jerry Venema, Nepco vice president, instituted the plan. L.A. Gardner of the company sales executive, is in charge of planning the session.

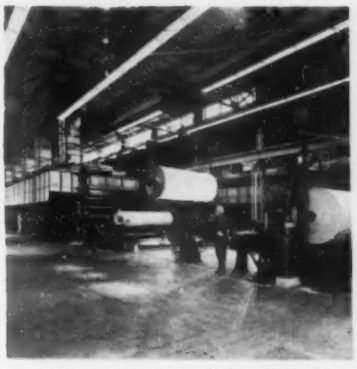
SONOCO Durolene

paper mill cores out perform all others . . .

SONOCO Durolene paper mill cores deliver super-performance; are unequalled in torque strength, have ultra-high crushing strength and possess greater scuff resistance. Here are four reasons for these outstanding qualities—

RESEARCH is the basis for all SONOCO paper mill cores. Durolene strength is the result of this exhaustive research and product development.

QUALITY CONTROL is rigidly maintained from raw material and through all phases of manufacture to finished product.



MODERN EQUIPMENT includes nine of the industry's most modern paper machines—each geared to precision production.

SKILLED PERSONNEL is the key to SONOCO uniform quality. SONOCO has nearly 60 years' experience in the manufacture of paper and converting it into quality products.

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If you require an economical paper mill core with exceptional strength, designed for long and efficient service — order SONOCO Durolene! SONOCO can also supply you with economical Duro returnable and non-returnable cores.

Both Durolene and Duro cores are made to your specification, with close outside tolerance. Standard sizes are available with famous BERMICO metal ends.

If your need is for a better core, write for samples today!

SONOCO

Paper Mill Cores

SONOCO PRODUCTS COMPANY

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Chemicals Causing Floor Failures?

Here's An Invitation to Consider . . .

When designing or replacing floors for CHEMICALLY CRITICAL AREAS!

* High Impact Resistance and Load Bearing Strength
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* Devran Epoxy Resin Binder Protects Against Chemical Attack
* Positive Bond—No Mortar Joints
* Saves Repeated Shutdowns
* Saves Structural Floor Base
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A request on your letterhead stating your floor corrosion problem will be followed by a personal inspection and specification by a qualified Truscon representative.

TRUSCON
Industrial Maintenance Division of
Devoe & Raynolds Co., Inc.
Laboratories
Detroit 11, Michigan

Indian Bureau Program Offers Services to Industry

The U.S. Indian Bureau's Industrial development program may be of particular interest to the pulp and paper industry, says Kurt Dreifuss, field representative for the Bureau at 1404 East 9th St., Cleveland 14, O.

Feature of this program is to enable the government, in cooperation with Indian groups and communities near reservations, to extend certain types of services and aid to manufactures seeking new plant sites. The Bureau also has authority, under a special vocational training program for American Indians, to reimburse manufacturers participating in the Industrial Development Program, for a portion of the costs involved in training new Indian workers.

Information is now being gathered in towns adjacent to Indian reservations in states west of the Mississippi River, as well as in Mississippi, North Carolina, Florida, Michigan and Wisconsin. In each of these localities, data will be collected on wage rates, labor supply of both Indians and non-Indians, building facilities, freight rates, and any special inducements being offered to interested manufacturers by states and communities. The findings will be made available to industry.

An example, six years ago, the Bulova Watch Co.—prompted by the North Dakota Indian Affairs Commission—established a jewel-bearing plant at Rolla, N.D. Two-thirds of the 150 employes are Chippewas from the nearby Turtle Mountain Reservation, who perform highly exacting bench and machine work.

New Additions Made By Georgia-Pacific Mill

Georgia-Pacific Paper Co. is extending its product line and increases capacity at its Toledo, Ore. 250-ton pulp and paper mill.

Edmund Ericksen, asst. res. manager said as result of installing a Morden Slush-Maker, a 2,000 lb. capacity component with 34 in. rotor, the G-P mill now produces No. 3 white linerboard. Purchased bleached kraft pulp is processed by the repulper for delivery to the machine via the secondary headbox.

Mr. Ericksen says addition of the Morden unit also opens opportunities for producing wet-strength papers. Recent addition of a third high-density storage tank—making a 300-ton total—and a second white liquor tank (both by American Pipe) further implements production.

Allis-Chalmers tackled this motor problem "COLD"

Plan to stay ahead... MODERNIZE!

Even heavy icing couldn't freeze this motor. An Allis-Chalmers customer required that this open-type *Super-Seal* motor (with *Poxeal* insulation) start even though embedded in ice.

The successful tests were conducted in the A-C Motor Laboratories where customers' motor needs point the way to continuous development programs.

Research, combined with testing of this type, has established Allis-Chalmers as a pioneer-leader in the motor industry. It has led to the most complete line of integral-horsepower motors; it has led to tremendous acceptance of such A-C developments as *Synduction* and tube-type motors, and now *Super-Seal* motors.

Pulp and paper processes can benefit from this pioneer-leadership. *Contact your A-C representative or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.*

Poxeal, Synduction and Super-Seal are Allis-Chalmers trademarks.

ALLIS-CHALMERS

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Save 3 Ways
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JEFFERSON LAKE
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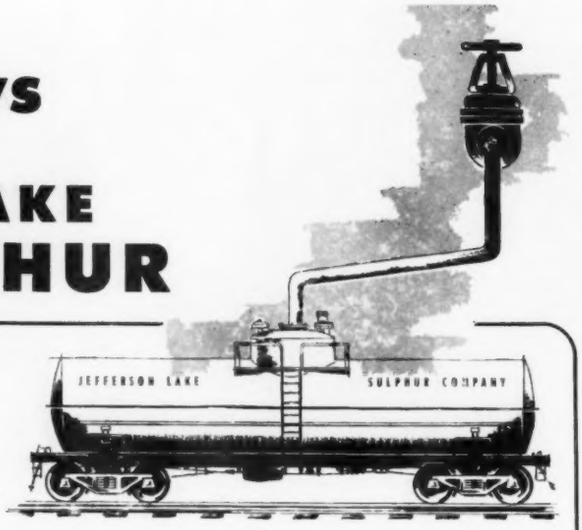

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3. **New, lower rail freight rates make tank car deliveries competitive with water transportation.**

You can rely on Jefferson Lake's many years of experience with tank car shipments for rapid delivery anywhere. Our fleet of specially designed and insulated tank cars, largest in the industry, stands ready to move your order. Send today for our illustrated brochure describing proper handling procedures for this new low-cost means of transportation.

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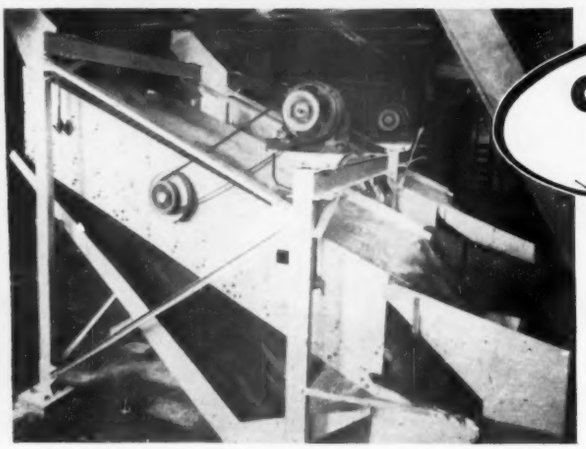

Carthage-Dillon Chip Screens

Full-Floating, Circle-Throw Vibrating Type

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Complete with woven-wire steel screens of suitable mesh, suspension frame with legs for floor mounting, feed tray, V-belt drive and motor base frame. Also furnished with suspension rods, springs, and brackets arranged for overhead installation.

It will pay you to take advantage of the unique combination of features offered by the Carthage-Dillon chip screen – high capacity, high efficiency, low cost of installation, power and maintenance. There is a complete range of sizes, backed by expert engineering service.

SEND THE COUPON TODAY.

CARTHAGE MACHINE COMPANY
CARTHAGE, NEW YORK

Please send complete information on the Carthage-Dillon Vibrating Chip Screens.

Name .....
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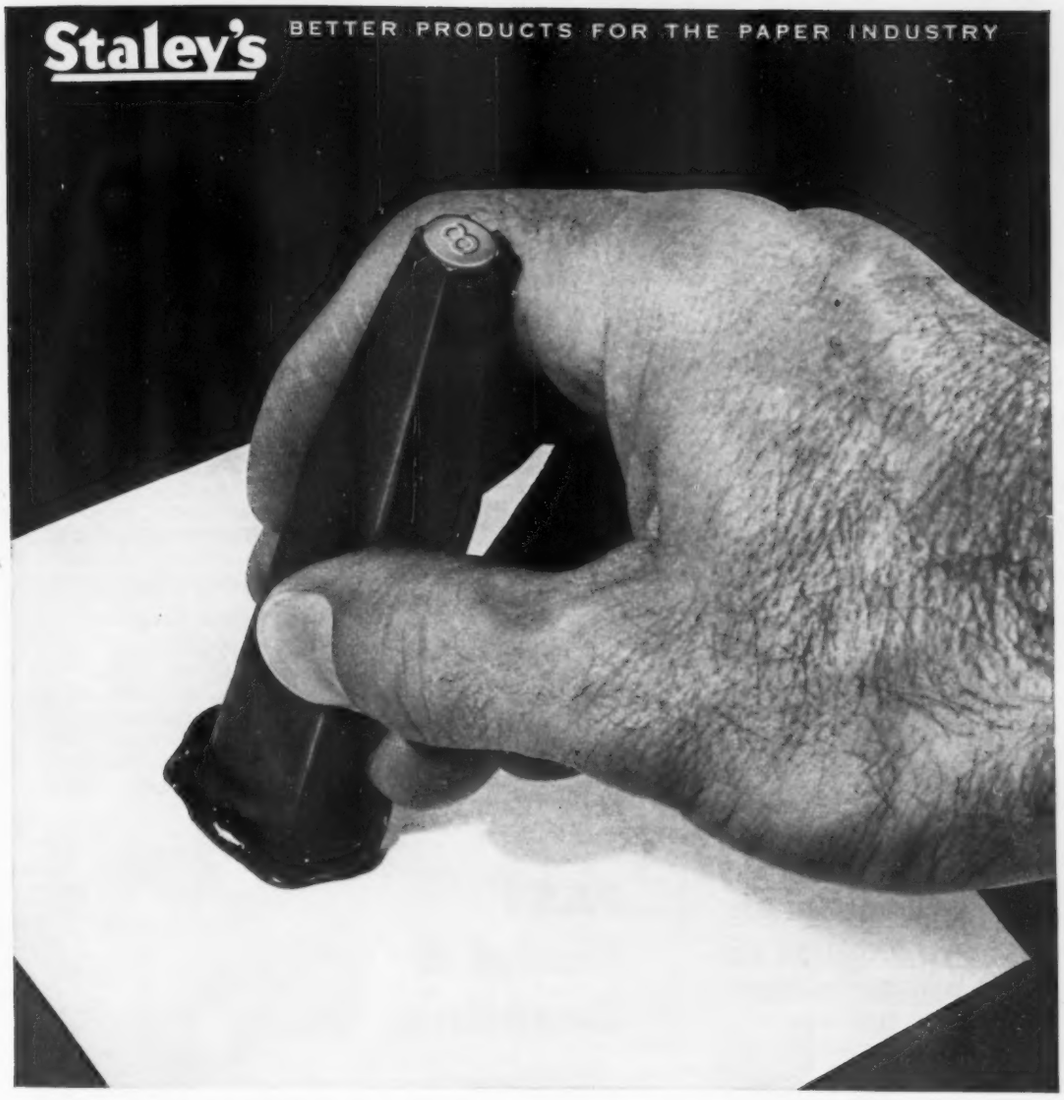
City ..... *Zone* .... *State* .....



WAX-PICK TESTS PROVE...

Staley's new Stadex® Dextrin 140 gives greater binding strength in higher-solids coating colors

Higher adhesive quality! Now you can use high-solids coatings of low viscosity *without sacrificing surface strength.*

Staley's new improved Stadex Dextrin 140 solves the problem of poor binding strength in high-solids coatings once and for all. Stadex Dextrin 140 is a high-solids clay coating adhesive with excellent stability, viscosity and binding strength characteristics. Used in combination with Stayco® (oxidized) starches, Stadex Dextrin 140 produces a coating of high adhesive quality.

Long a standard in the paper industry, Stadex 140, like all Staley dextrins, is now made by a brand new dextrinization technique that guarantees you even better adhesives of top quality, minimum color and unparalleled uniformity.

Why not get the full story on Stadex 140 for yourself now?

See your Staley representative or write us for details today.

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A. E. Staley Mfg. Co., Decatur, Ill.

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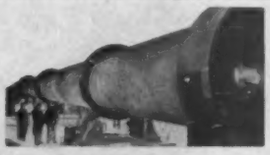

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—says THE BROWN COMPANY
Quality Paper Makers of Berlin, N. H.

"During a seven-month period before using LUBRIPLATE No. 130-AA in the bearing of our Kraft Mill Lime Kiln, we used a conventional oil at a cost of $2,134.00. In the seven months that followed, we used LUBRIPLATE No. 130-AA for initial filling and replacement at the cost of $35.84."

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE GREASE AND FLUID TYPE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.

LUBRIPLATE is available in grease and fluid densities for every purpose . . . LUBRIPLATE H. D. S. MOTOR OIL meets today's exacting requirements for gasoline and diesel engines.

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK" . . . a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

NEED HELP

with an INDUSTRIAL WASTE TREATMENT PROBLEM?

If you need help to solve an industrial waste treatment problem, here are two quick steps to the right solution! *First,* send today for your copy of informative Bulletin No. 5578, which gives you a quick picture of what CHAIN Belt Waste Treatment Equipment and processes can do to solve your problem. *Second,* ask for a Rex Man to review your problem and help you select the equipment which will provide effective treatment of your industrial waste. For action, just mail the coupon!

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LITERATURE

Corrosion-Resistant Coatings

Carboline protective coatings for industrial equipment are described in Bulletin No. 100 available from Carboline Co., 32 Hanley Industrial Court, St. Louis 17, Mo. The booklet gives a breakdown of the four classifications of corrosive conditions according to severity of exposure. A chart enables selection of coatings according to service requirements; physical properties as well as chemical resistance are shown.

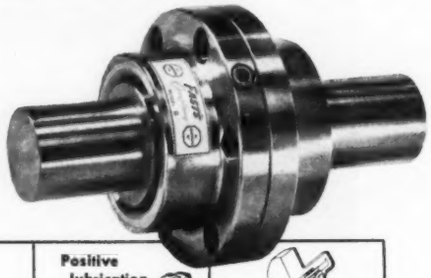
Clarifiers and Thickeners

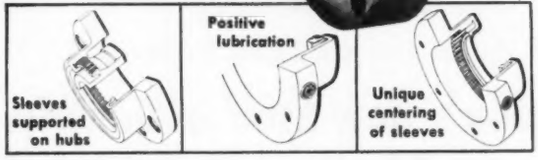
Sixteen-page Bulletin W-800 describes three types of clarifiers and thickeners for handling liquid-solids separation in water and sewage and industrial waste treatment. Detailed variations in large and small installations are included. The publication is free on request to Infilco Inc., Tucson, Ariz.

Gearflex Couplings

Dominion Engineering Co. Ltd. has recently published a catalogue describing its complete Gearflex coupling line. Included are specifications and engineering information. The publication may be obtained by contacting the firm at P. O. Box 220, Montreal, Que.

FAST'S Model B Coupling





reduces downtime and upkeep for light-to-medium drives!

Now you can profit from the durability and economy of famous Fast's couplings in a smaller and lower-cost version—available in 5 sizes for shafts ½" to 3⅛" in diameter.

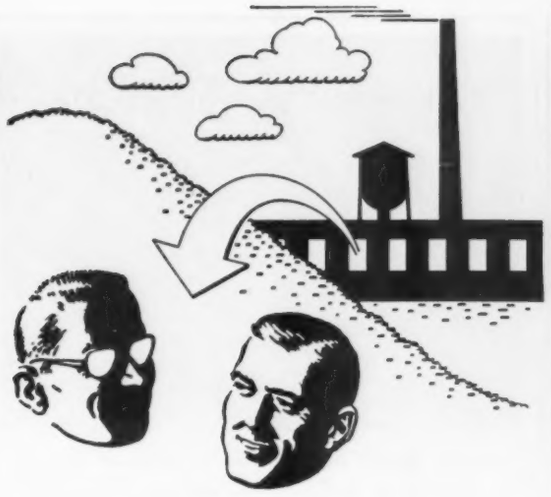
The Model B coupling gives you the same features that have made Fast's the world's leading coupling for over 35 years. You get the same trouble-free performance, longer service life and lower maintenance costs. You also get prompt delivery because stocks are on hand to meet practically every need. Free engineering service is also available.

Write today for more details to KOPPERS COMPANY, INC., Fast's Coupling Dept., 5104 Scott Street, Baltimore 3, Maryland.

Engineered Products Sold with *Service*

KOPPERS

THE ORIGINAL *FAST'S Couplings*



How do you measure calender roll performance?

"... in sales and profits"

It's not far from the calender to the customer. Fine calendering makes sales.

That's why many mills standardize on Butterworth Dura-Smooth Rolls. They enjoy greater opportunities for sales and profits — by improving calender performance, lowering costs and increasing tonnage.

Prove it to yourself. Put one Butterworth Refill in your calender stack with any other roll. Record the many extra hours of service before it needs turning down or refilling. Breakdowns, shut downs and delays will practically disappear.

Made to meet your specifications, Butterworth Rolls are pretested for hardness, smoothness and density before delivery.

Write for a quotation on a new Butterworth Roll or for refilling your present rolls. We can furnish rolls for all makes of calenders.

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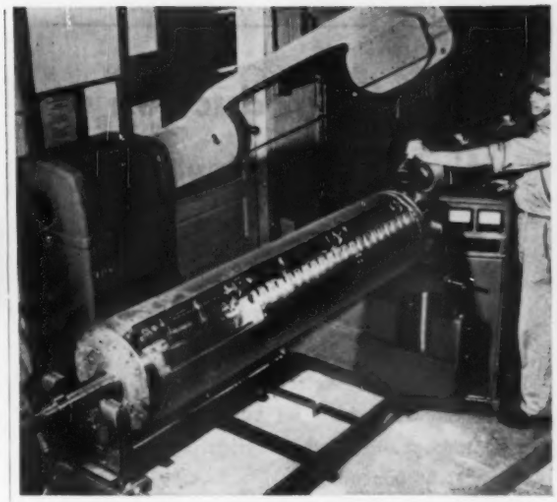

Stewart-Warner Balancer Model 708 balancing paper mill roll

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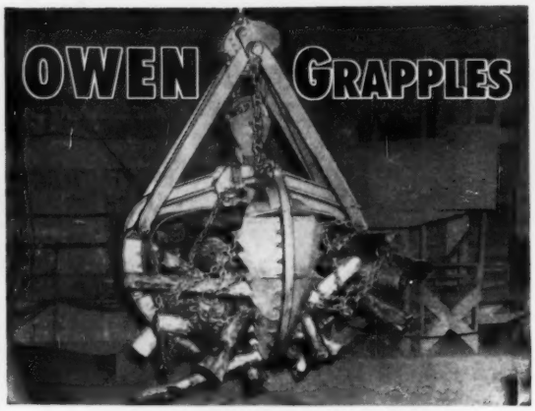

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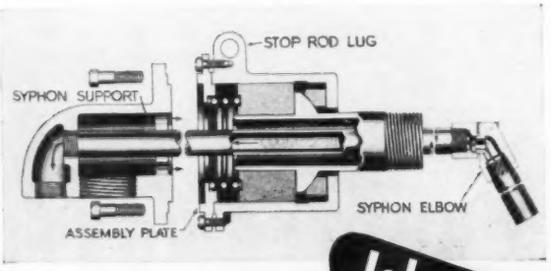

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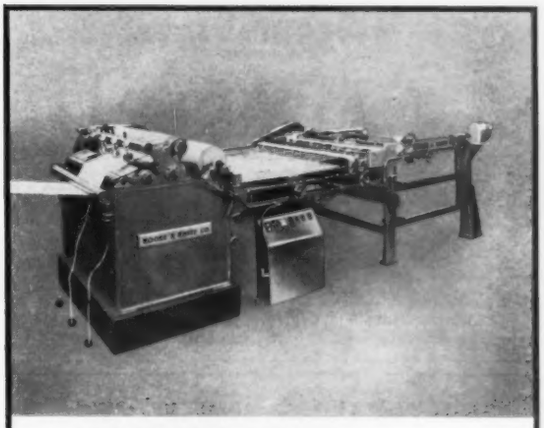

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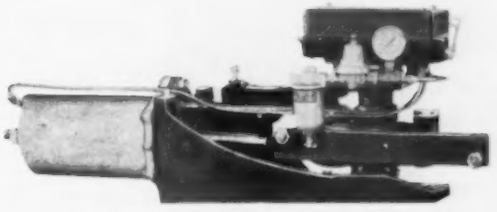

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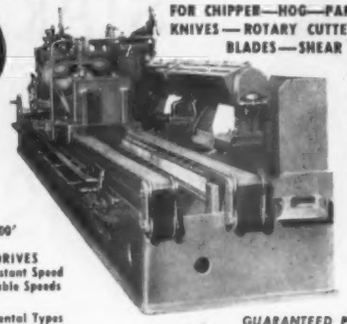

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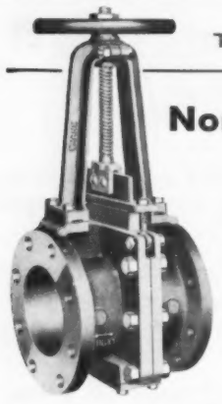

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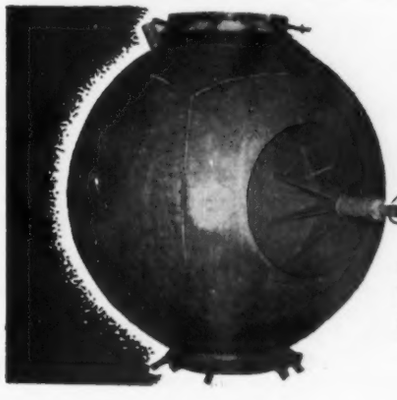

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The Last Word — PULP & PAPER Editors' Page

Mr. Elderkin and Mr. Nicholson Give Credit Where Credit is Due

K.O. Elderkin, Nova Scotia born 1959 TAPPI Gold Medal winner, developed "one of the most successful pulp and paper operations in existence" for Bowater Southern at Calhoun, Tenn., said Gunnar Nicholson, when he made the medal presentation in New York recently at Paper Week's climactic TAPPI luncheon. Bowater Southern's four high speed Beloit newsprint machines include No. 4, now able to run over 2,500 ft. per minute, Mr. Nicholson said.

The facts of the case are that No. 4 actually started right up in December at over 2,000 fpm, an achievement which only a few years ago few would have thought possible.

Mr. Elderkin pioneered underwater pulpwood storage at Crossett and Calhoun, which successfully abated deterioration and improved quality of wood, said Mr. Nicholson. He also noted that Mr. Elderkin introduced the first vacuum pick-up for kraft at Crossett. Now Mr. Elderkin heads Bowater developments all over the world, Mr. Nicholson said, his duties including directing the building of a new 400-ton bleached kraft mill at Catawba, N.C., and hardwood plants at both Calhoun and Catawba.

But Mr. Nicholson did correct a TAPPI press release which unfortunately appeared in some publications crediting Mr. Elderkin with developing the Allis-Chalmers stock pump and Rotareaed Deculator. Mr. Nicholson said credit for the stock pump goes to Frank Forrest and for the Deculator to Carleton Clark and Wes. Bennett and "Mr. Elderkin makes no claim to them."

Forrest

Clark

Bennett

PULP & PAPER in its articles on these inventions did give the proper credit. Notable was PULP & PAPER'S exclusive article in the Nov. 1957 issue,, page 61, concerning Mr. Forrest's work in developing ACAP, the Allis-Chalmers adjustable pump, with its variable capacity, adjustable head and elimination of plugging or dewatering.

That article correctly stated that back in 1952, it was Jim Kraus of Kimberly-Clark Corp., who inspired Mr. Forrest to "design a pump so that if I want 30 gpm I can get it without plugging or dewatering." The new pump, ACAP, was placed on exhibit at the Cincinnati Engineering Conference in the fall of 1957. Its secret is an internal by-pass cylinder which is adjusted to create a variable clearance between the revolving impeller blades and the cylinder.

Mr. Forrest, "Mr. Pumps" to his Allis-Chalmers and industry colleagues, has one of the most distinguished careers in the industry in technical work on studies of pipe friction of paper stock and of pump development work.

Much more than this was told in the exclusive story in PULP & PAPER about Mr. Forrest and his work published in the Nov. 1957 issue.

We are very pleased to be able to say that PULP & PAPER did give credit where credit was due in this case and that it also has done in previous articles about the Deculator. In the case of the Deculator, PULP & PAPER worked very close with inventive "Carl" Clark, one of this industry's outstanding engineers, in all of its reports on that revolutionary new equipment of a few years back.

No one in this industry has done more than Mr. Elderkin, and his good friend, Mr. Nicholson, to advise and inspire machinery manufacturers and their engineers in many important industry advances made in the past 20 to 25 years. We would have no trouble in naming quite a list of companies and engineers who acknowledge a debt to Messrs. Elderkin and Nicholson. But the latter named gentlemen are the first to want no part of any credit for the actual development work in these cases. It was characteristic of them to speak up for Messers. Forrest, Clark and Bennett, as Mr. Nicholson did, in addressing the 1,200 or more guests at the TAPPI luncheon in behalf of Mr. Elderkin.

We are very pleased that PULP & PAPER, also, properly gave credit where it belonged.

Timing of Paper Week Forum

The Joint APPA-TAPPI research program held on the Starlight Roof of the last afternoon of Paper Week (Feb. 26 in New York) was an outstanding event.

The prominent men who took part from both within and outside the industry, emphasized the great need this industry's leadership recognizes for increasing its research activities. Compared to some other industries, pulp, paper and paperboard are laggards in this respect. It is proving a costly neglect, in view of the stiffer competition which paper is meeting from aluminum, glass, synthetic fibers, various plastics, polyethylene especially, and now the new polypropylene (a transparent cousin of the translucent polyethylene).

But instead of being held on the last afternoon, we suggest such a meeting might have been far more effective if it had been held on Monday morning instead of Thursday afternoon, when hundreds of delegates were heading for their homes. TAPPI already had closed its program at midday Thursday with its annual luncheon.

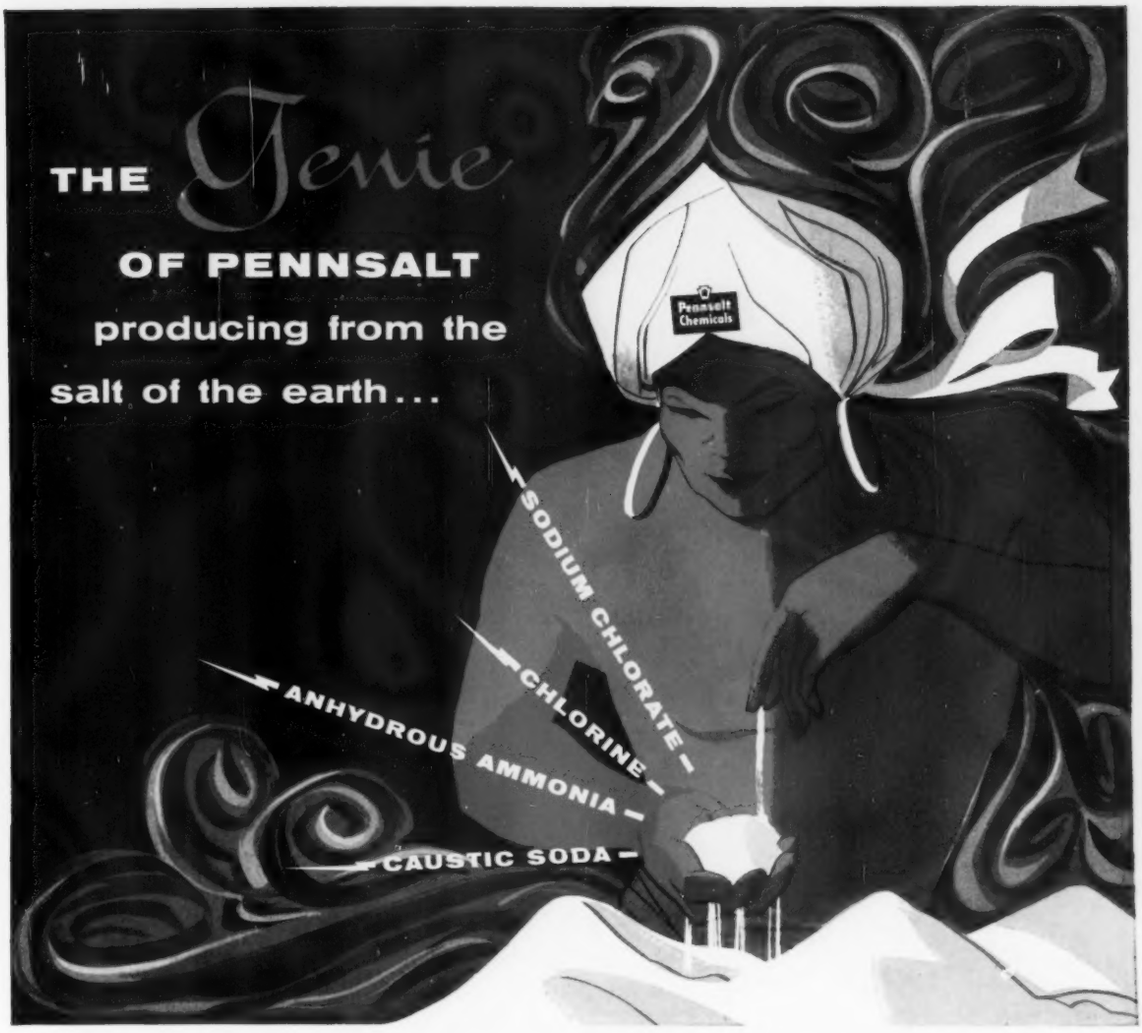
This was the kind of meeting that would have keyed the whole convention. It would have set the theme or the goals for the whole week if it had been held at the outset, instead of at the end. In future years, if such meetings are held, their timing might be given some reconsideration.

Industry Finds Its Voice

The Tacoma (Wash.) *News-Tribune* recently acclaimed the Far Western pulp and paper industry for "finding its voice."

It referred to the organization of the Northwest Pulp and Paper Association as a public relations working unit by the cooperative effort of mills in the area.

"Public relations has been a prime need of the industry," said the newspaper. "Its reticence about speaking its piece has, we fear, at times been costly."



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